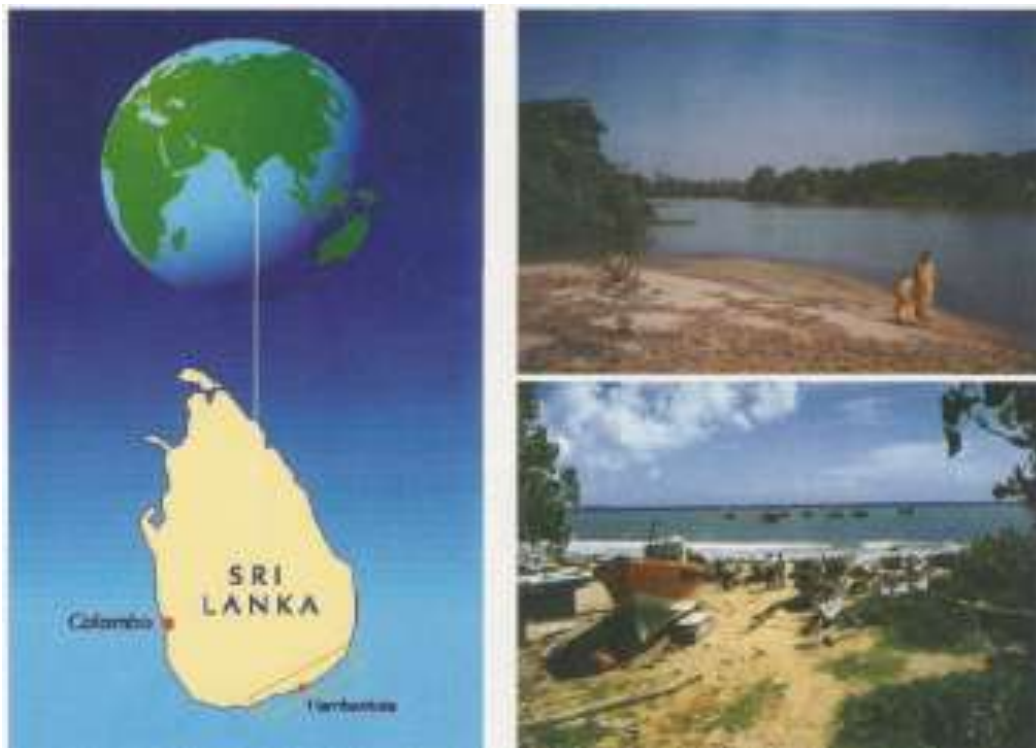


Hambantota **HICZMP**
Integrated Coastal Zone Management Project

HICZMP Output No. 2b

Special Area Management Plan for Mawella and Kudawella Coastal Area



**SOUTHERN DEVELOPMENT AUTHORITY OF SRI LANKA
COAST CONSERVATION DEPARTMENT**

HICZMP - Report

A project funded by the Government of Norway

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|--|--|----------------------|
| Title Special Area Management Plan for Mawella and Kudawella Coastal Area Mawella-Kudawella | Serial No. 2b/2000 | Date 16.11. 2000 |
| | Report No. Sub-No. 2b | Pages Price |
| Local Consultant(s) K.N.J. Katupotha Indra Ranasinghe | Topic group HICZMP Output 6 | Distribution Free |
| | Geographical area Hambantota District, Sri Lanka | Printed Sri Lanka |

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|---|---|
| International Consultant(s) / Task manager(s) Norwegian Institute for Urban Water Research Kari Nygard <small>hjelpelinje på 4 pt som gir "luft" etter siste linje - skrives ikke ut - er "hidden"</small> | Int. Consultant ref. O-97211 <small>hjelpelinje på 4 pt som gir "luft" etter siste linje - skrives ikke ut - er "hidden"</small> |
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Abstract

This Special Area Management Plan (SAMP) for Mawella and Kudawella gives a resume of the physil, environmental and socio-economic issues relevant to this area., designated as a "special area" in the national Coastal Zone Management Plan (1997), and the policies and strategies recommended to resolve them. It is also proposes the appropriate institutional mechanism necessary for implementation.

The SAMP has been formulated in close collaboration with, and participation from, the Special Area Management Co-ordinatting Committee for Mawella and Kudawella.

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PREFACE

The Hambantota Integrated Coastal Zone Management Project (HICZMP), first phase, is an umbrella project comprising 14 sub-projects/outputs, which were successfully implemented during a period of three years from 1997 to 2000. The projects are:

- 1) Integrated zoning plan for the coastal area of Hambantota district
- 2) Special Area Management (SAM) process at two prioritised sites: Mawelle lagoon and Hambantota dunes
- 3) Awareness campaign on coastal resources management
- 4) Mapping of environmentally sensitive areas, including recommendations for conservation
- 5) Identification of adverse impacts on the environment from development activities and implementation of mitigation measures
- 6) Existing legal provisions reviewed for purpose of streamlining
- 7) Institutional strengthening in support of coastal zone management in Hambantota District
- 8) Mechanisms for project co-ordination, implementation and effective law enforcement
- 9) Technical support to the coastal extension centre/foundation at Rekawa lagoon
- 10) Coastal and marine pollution monitoring program, including baseline survey
- 11) Consultative mechanism to obtain participation of stakeholders in the management and development process
- 12) Program for utilising existing and planned environmental facilities
- 13) Environmental guidelines for developers, and the public
- 14) Project administration.

HICZMR was funded by a grant from the Government of Norway. The Southern Development Authority of Sri Lanka (SDA) and the Coast Conservation Department (CCD) has been responsible for the co-ordination and the implementation of HICZMP respectively. Inter-ministerial commitment has been ensured through National Steering Committee (NSC), while the Project Co-ordination Committee (PCC) has functioned as the main forum for the local authorities, non-governmental organisations, and other stakeholders. The project office located in the town of Hambantota has been the focal point for the project activities.

The technical project work has been carried out by Sri Lankan consultants with technical support provided by the Norwegian Institute for Water Research (NIVA), and with assistance from the Norwegian Institute for Urban and Regional Research (NIBR).

This report covers **HICZMP sub-project/output no.2b: Special Area Management Plan for Mawella and Kudawella Coastal Area**. The local consultants: Dr. K. Katupotha and Mr. I Ranasinghe have been responsible for developing the draft report together with Dr. Kari Nygaard, NIVA, C. Fernando, Project Director HICZMP, Mr. Sorenson, NIVA, and Mr. Wijayasinha, have edited the final version.

It is hoped that this report and the other supporting documents will be useful to the stakeholders in Hambantota district as well as for all those stakeholders, such as state agencies, non-governmental organisations, planners, researchers and donor-agencies, which are involved in coastal zone management in Sri Lanka.

We wish to place on record our appreciation of the devoted work of all those who have participated actively in the implementation of the project, the consultants for preparing the documents and the project management for publishing them.

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*Secretary
Ministry of Fisheries and Aquatic Resources
Chairman NSC, HICZMP.*

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Hambantota
Chairman PCC, HICZMP*

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ABRIVIATIONS

| | |
|--------|--|
| CCCRMA | COAST CONSERVATION AND COASTAL RESOURCE MANAGEMENT ACT |
| CCD | COAST CONSERVATION DEPARTMENT |
| CRMP | COASTAL RESOURCE MANAGEMENT PLAN |
| CZM | COASTAL RESOURCE MANAGEMENT |
| DFEO | DISTRICT FISHERIES EXTENSION OFFICER |
| DI | DEPARTMENT OF IRRIGATION |
| DS | DIVISIONAL SECRETARY (TANGALLE) |
| GNDS | GRAMA NILADHARI DIVISIONS |
| HICZMP | HAMBANTOTA INTEGRATED COASTAL ZONE MANAGEMENT PROJECT |
| IRD | INTEGRATED RURAL DEVELOPMENT |
| NGO | NON GOVERNMENTAL ORGANIZATIONS |
| MWCC | MAWELLA COORDINATING COMMITTEE |
| PS | PRADESHIYA SABHA |
| SAM | SPECIAL AREA MANAGEMENT |
| SAMCC | SPECIAL AREA MANAGEMENT COORDINATING COMMITTEE |
| UDA | URBAN DEVELOPMENT AUTHORITY |
| UNICEF | UNITED NATIONS INTERNATIONAL CHILDREN'S EMERGENCY FUND |

1. BACKGROUND, PROCESS, GOALS AND OBJECTIVES

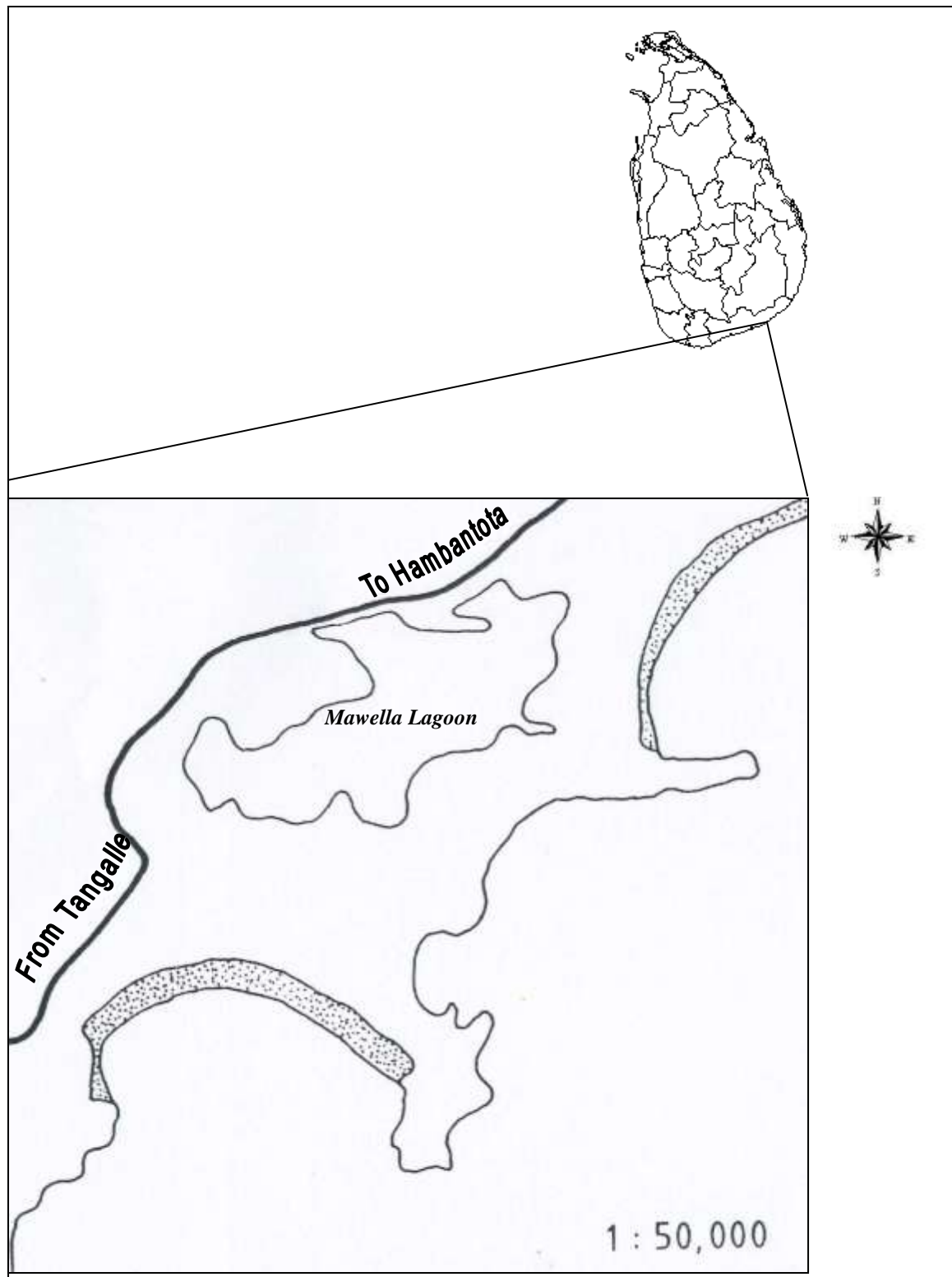
1.1 Introduction

Mawella and Kudawella are two traditional fishing villages, which are located about 192 kilometers to the south of Colombo in the Tangalle Divisional Secretariat Division within the Hambantota district. They lie within longitudes $80^{\circ} 43'$ - $80^{\circ} 45'$ and latitudes $5^{\circ} 58'$ - $6^{\circ} 00'$ (Figure 1). The extent of the lagoon is approximately 91 ha (225 acres) and the other unique coastal features located in the area are the blowhole (Hummanaya) a geological phenomenon, water to cross up to be fresher mangrove fringes, rocky headlands and wide beaches.

Mawella and Kudawella coastline includes bays, headlands, rock outcrops with cliffs and points, as well as pocket beaches. These features together with the community form a complex coastal resource system. In the past, Mawella Lagoon was known to be a highly productive water-body and its bio-diversity and fish production were high and consequently provided sustenance to a large number of people in this area. However the environmental conditions in the Mawella lagoon and the environs gradually declined over the years towards a state of degradation largely due to a number of man-induced factors supplemented by natural causes. This has in turn led to a number of social and economic problems in the area.

Kudawella is a traditional fishing village and is now well known because of the blowhole located in the village and the modern fishery harbour currently under construction. Kudawella Blowhole has been identified by the National Coastal Zone Management Plan (1990) as one of the high priority scenic sites Sri Lanka's coastal zone of the country. Due to the publicity given through the mass media, it has become one of the most popular tourist attractions in the southern region and has begun to draw large numbers of visitors resulting in considerable pressure on the Kudawella village and its environment.

FIGURE 1. LOCATION MAP OF THE MAWELLA AND KUDAWELLA SAMP AREA



Taking these circumstances into consideration, Mawella lagoon and the surrounding coastal area including Kudawella have been identified in the Revised Coastal Zone Management Plan, Sri Lanka

(Revised CZM Plan) of 1997 as a high priority site. This requires immediate management interventions in the form of Special Area Management Planning in order to overcome the emerging environmental and socio-economic problems. In this context, the planning workshop held in 1997 August prior to the preparation of the Hambantota Integrated Coastal Zone Management Project (HICZMP) recommended that these sites be adopted by the HICZMP for the implementation of a Special Area Management Plan (SAMP). Accordingly, the planning work at these sites commenced in September 1998. The Special Management Area encompasses 28 villages in 12 Grama Niladhari (GN) Divisions with a total land area of 737.2 ha and a coastline of 4 kilometers in length (Figure 2).

1.2 Management Approach and the Planning process

1.2.1 Management Approach

The management approach that has been adopted in formulating the SAMP for Mawella and Kudawella can be described as a collaborative or co-management¹ process, focusing on the environmental, social and economic issues. The salient features of this management approach are the following.

- The responsibility for resource management, conservation and economic development is shared between government institutions and the user groups
- There active involvement and participation by the stakeholders in designing, implementing and enforcing management regulations²
- Decision making is shared between government agencies and other stakeholders through the community level coordinating committees and the divisional level coordinating committees
- Management decisions are taken on the basis of traditional knowledge and the scientific research
- The integration of central government agencies, local administration and political authorities
- Institutional arrangements under which central and local government agencies as well as other stakeholder groups are represented in coordinating committees

Benefiting from the valuable experience gained through the preparation and implementation of Rekawa and Hikkaduwa Special Area Management Plans³, some modifications shown necessary have been introduced to the planning process in order to avoid possible shortcomings. In this regard, careful attention has been paid to, and emphasis placed on the following:

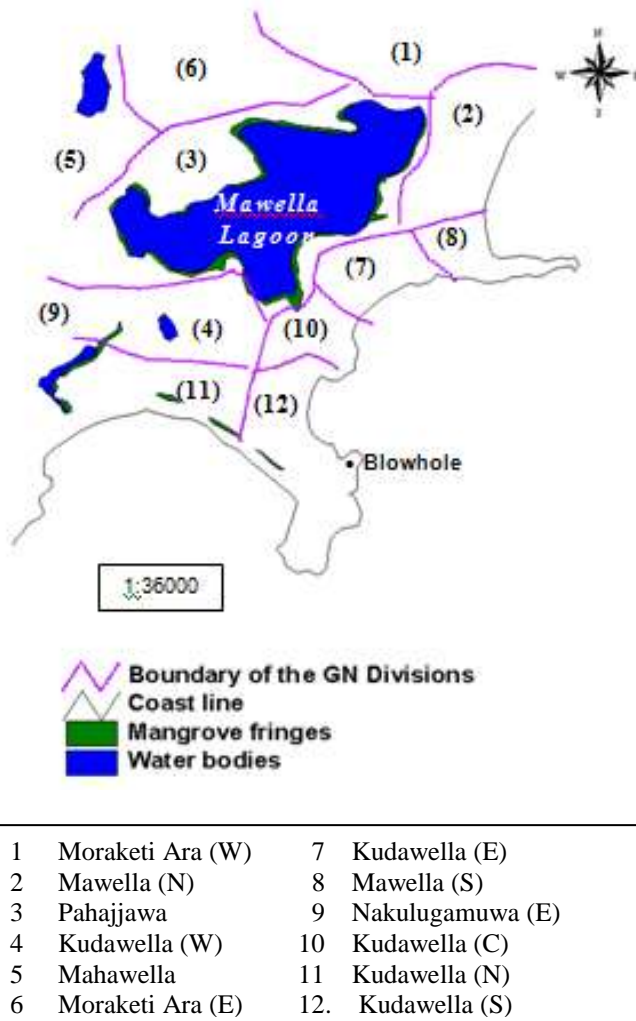
- Site selection through maximum stakeholder participation
- Enhancement of community participation throughout the planning process
- Evolving a consensus among the ruling and the opposition political authorities, and
- Initiating implementation tasks while planning is yet in progress

¹ Cooperative – management, joint management and collaborative management are all terms synonymous with Co-management

² According to existing legal framework operating in the country, the enforcement responsibility mainly lies with the government or semi-government agencies. Therefore, in Mawella – Kudawella SAM implementation process, enforcement responsibility also will be primarily undertaken by government agencies.

³ Special Area Management Plan for Rekawa Lagoon-1994 and Special Area Management Plan for Hikkaduwa 1994 prepared by Coast Conservation Department in collaboration with University of Rhode Island funded by USAID

FIGURE 2 GRAMA NILADHARI DIVISIONS OF THE MAWELLA AND KUDAWELLA SAMP AREA



1.3 Planning Process

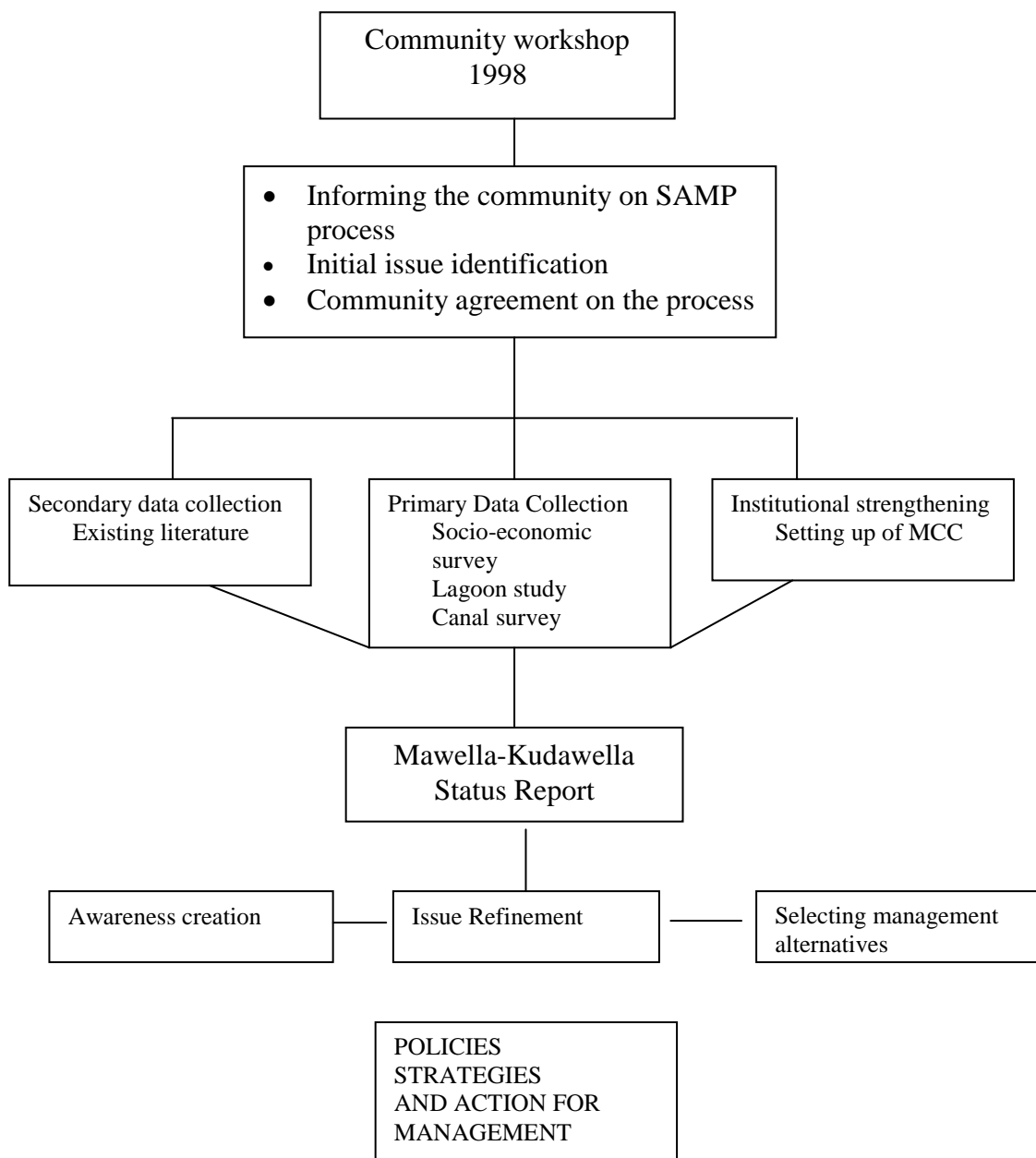
The Mawella and Kudawella SAM process initiated in October 1998, with the active involvement of the concerned communities, is an important event in the Coastal Resource Management process in Sri Lanka. The involvement of true stakeholders in the planning process was ensured through a continuing consultative process based on the principles of co-management approach. Thus right from the initial phase, community groups, NGO'S and relevant local and national level agencies actively participated in all activities. This includes, the determination of the planning area, the identification and prioritization of the relevant issues, setting out of objectives and developing policies for management, and the formulation of management strategies and the activities (Figure 3).

The process of preparing the SAM Plan for Mawella Lagoon, Kudawella Blowhole and its immediate environs involved a number of logical steps. In the initial phase, the team of consultants assisted the community in the identification and analysis of the problems and opportunities pertaining to the environmental, social and economic aspects in the area and prepared a status report on environmental and

socio-economic profile of the sites. In accomplishing this task the non-availability of data proved to be a major constraint. Hence primary data and information had to be collected by carrying out several field studies and rapid assessments. This was supplemented by the collection of secondary data and information from a variety of sources. Thus in connection with profiling of the present status the following activities were under taken:

- A Socio-economic survey
- A study on the economic significance of the blowhole
- A Participatory Rapid Assessment
- Several Community workshops and focused group discussions

FIGURE 3 SAM PLANNING PROCESS, MAWELLA-KUDAWELLA



Through the above process, the prevailing resource management issues, their linkages and the constraints and opportunities for coastal resources and environmental management in Mawella and Kudawella were identified and the boundaries relevant to the planning area were determined. Following this, the issue refinement and prioritization were carried out with the active participation of the stakeholders as well as the use of the findings of the studies carried out under the other sub projects of the HICZMP. Almost concurrently, a Special Area Management Coordinating Committee was set up at the Divisional level under the chairmanship of Divisional Secretary (Tangalle). In addition, two separate committees were also established for Mawella and Kudawella to further facilitate the planning process and to stimulate the community interest in the management of the resources and environment in the area concerned. The refinement and finalization of issues and management options was thereafter followed by discussions with the community at a participatory workshop. Simultaneously the planning team also explored and investigated development options available. From these emerged several possibilities, one led to the preparation of a plan for the development of the blowhole and its environs. Another was the conceptual plan for the rehabilitation of the Mawella canal including the restoration of the sea-lagoon connection. At the end of this process a SAM Plan was prepared and distributed in joint meetings of the Divisional and Community level Coordinating Committees and among other stakeholders for their comments.

The SAM Plan for Mawella Lagoon and Kudawella Blow Hole and its immediate environs was finalized by all stakeholders including representatives from Mawella Coordinating Committee, Kudawella Coordinating Committee, Pradeshiya Sabha and Divisional Secretariat and other local/ provincial/central level agencies at the final planning workshop held in February 2000.

The key steps involved in the planning process is shown in Figure 4, while the list of government and non-government agencies and other stakeholders involved in the planning process is given in Figure 5. A suitable institutional mechanism to support the implementation and ensure sustainability of the further planning work and monitoring was agreed upon with stakeholder participation and consensus.

FIGURE 4 KEY STEPS INVOLVED IN THE PLANNING PROCESS FOR MAWELLA-KUDAWELLA SAMP AREA

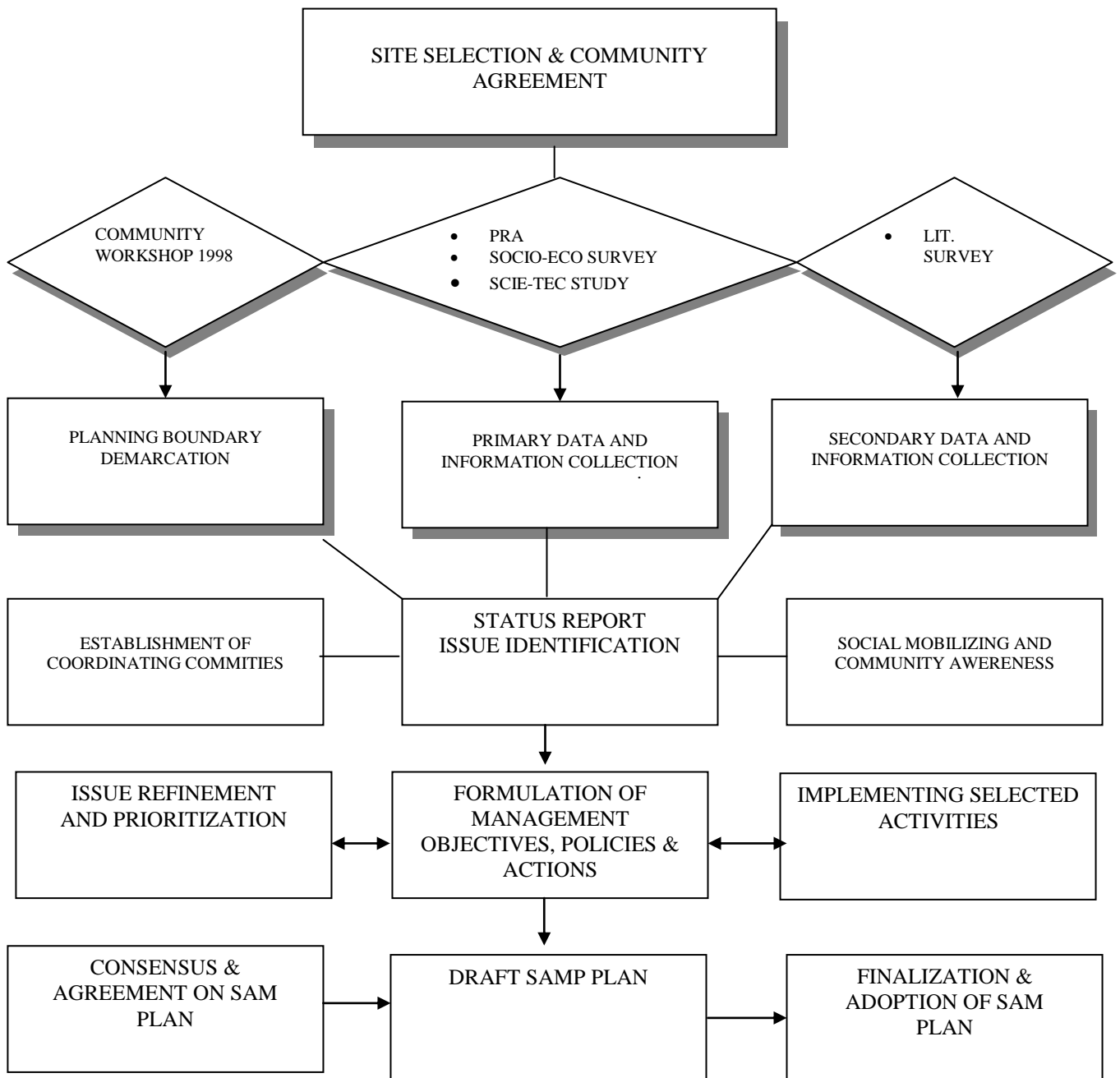


FIGURE 5 INSTITUTIONS AND AGENCIES INVOLVED IN THE PROCESS

**Funding,
Administration
Facilitation**

COAST CONSERVATION
DEPARTMENT

MINISTRY OF FISHERIES AND
AQUATIC RESOURCES

HICZM PROJECT

SOUTHERN DEVELOPMENT
AUTHORITY

CEYLON TOURIST BOARD

Coordination

National Level Steering Committee

Mawella Coordinating Committee

Kudawella Coordinating Committee

**Planning
Decision-making
Implementation**

Divisional Secretary
Chairman, PS
Opposition Leader, PS
District Fisheries Extension
Officer
Rep., SDA
Public Health Officer
OIC –Police ,Tangalle
Manager, Samurdhi
GN
Environmental Officer
Planning Officer, UDA
Manager, WR&DB

Community Coordinating
Committees-Mawella &
Kudawella
Lagoon Fisheries Society
Small scale women
fisheries society
SANASA
Janashakthi Bank
Samurdhi Organization
Blowhole protection
society
Fisheries cooperative
Society
Sarvodaya
Death donation Society

1.4 Goals and Objectives

1.4.1 Goal

To conserve and manage coastal resources of Mawella and Kudawella area by enhancing resource base and environmental quality with a view to promote and strengthen the social and economic status of communities.

In considering the prevailing social, economic and environmental issues in the Mawella and Kudawella coastal area, the above Goal has been formulated with the consensus of all stakeholders. The prime target of this plan is to minimize the impacts of adverse issues prevailing in the area through proper management and thereby increase the benefits to the communities. To accomplish this target, all stakeholders have agreed upon a set of long-term and short-term objectives as indicated below.

1.4.2 Overall Objectives

- Develop coastal resource of Mawella and Kudawella area based on sound management concepts and practices, in order to ensure their sustainable use
- Create better environmental conditions conducive to improving the health, increasing the income of the communities.
- To enhance cultural, social and ethical values among the communities within the SAM area.

1.4.3 Specific Objectives

- Establish Special Area Management systems based on integrated co-management concepts for the sustainable development of Mawella and Kudawella coastal areas
- Minimize pollution in and around the Mawella lagoon and the Kudawella blowhole
- Provide employment opportunities and enhance recreational opportunities for the general public
- Improve the bio-diversity and productivity of Mawella lagoon
- Rehabilitating the existing canal of the Mawella lagoon, thereby restoring the lagoon to its original state
- Improve public access to the sea beach and to the lagoon
- Develop infrastructure facilities in order to improve the economic, social and environmental condition of the communities
- Minimize user resource used conflicts in the area
- Improve public safety pertaining to blowhole
- Enhance aesthetic quality of the blowhole and its immediate environs
- Strengthen capabilities of the community organizations on integrated resource management, program formulation and monitoring
- Identify and establish legal and institutional mechanism for resource management

1.5 Justification of Management Interventions

The declining resource base coupled with increasing population growth in Mawella and Kudawella area provides the primary justification for initiating management interventions at these sites. The available information reveals that the fishery productivity of the Mawella lagoon has decreased to a minimum level creating negative impacts for the fishing community (Jayakody, 1993). The canal that some years ago connected the lagoon with the sea allowing two-way movement of water has been completely cut off. This disruption of the water flow has been brought about by a chain of factors ranging from natural siltation to human actions such as filling and encroachments of its banks and dumping of solid waste into the canal etc. Clearing of mangroves in the environs of the lagoon has also made an adverse impact on the lagoon uses.

The degradation of the environmental quality of the blowhole and its surroundings in the Kudawella village and the increasing user conflicts are the other factors which call for proper management interventions. Increasing numbers of people visiting the blow hole and the problems associated, such as increased levels of pollution particularly dumping of solid waste largely in the form non bio-degradable materials, traffic congestion, lack of proper sanitary conditions and potable water and unauthorized constructions are some of the main issues which warrant immediate attention and action. In addition the new fishery harbour under construction is also likely to give rise to new environmental and social issues.

2. MAWELLA LAGOON, KUDAWELLA BLOWHOLE AND RELATED COASTAL ENVIRONS

2.1 Physical setting

The Mawella lagoon appears to have been a marine water body protected and partially isolated from the open sea during the Mid- and late Holocene epoch due to the sea-level rise by about 3.0 meters above the present level (Katupotha 1988a & 1988b). Following the lowering of sea level around Late - Holocene, Mawella lagoon evolved as a separate lake behind the sand barriers. Due to the same process, Kudawella headland and its adjacent landform also emerged in its present configuration.

Geologically, the Kudawella headland and its environs are mainly formed by undifferentiated meta-sedimentary rocks and charnockites (Cooray, 1984), and the headland is elevated approximately 30m above mean sea level (msl). The 'Flat Terrain', where Mawella lagoon is located has been altered by aeolian, marine and fluvial influences. Undulating topography extends from the flat terrain to northward rising about 70m above the msl.

The undulating terrain located towards the north of Mawella lagoon is mainly covered by 'Noncalic Brown soils of the Reddish Brown Earths' and 'Low Humic Clay soils. The soils of the old raised beaches and incipient dunes have been named as sandy regosols. Texture of these sands range from fine to moderately coarse. In addition, 'Alluvial Soils' of variable drainage and texture can be found in flat valley bottoms and water logged areas (Panabokke, 1996).

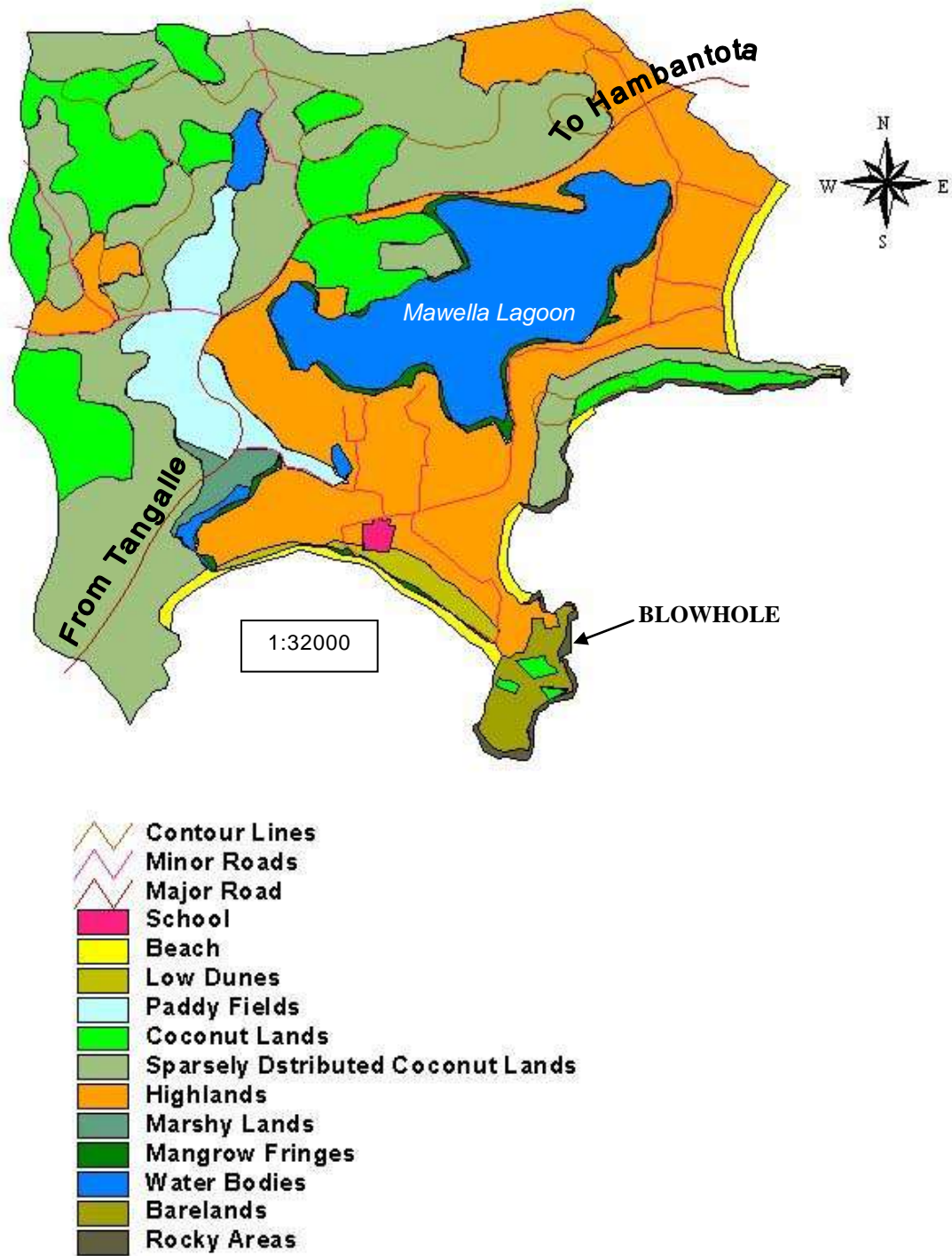
The rainfall data obtained from Nalagama Station which is located closer to Mawella and Kudawella, indicates a rainfall between 1250 mm to 2000 mm per year during the period between 1978 and 1997 with two maximum seasons (Southwest monsoon - early May to July- and convectional-cyclonic-depression - October to November). In 1997, the Nalagama Station received 2200-mm annual rainfall. From the annual rainfall (1997), 20 percent was received between months of April and May and another 40 percent received from September to November. Periodically, this rainfall pattern is influenced on transportation of sediments from high ground areas to the lagoon.

2.2 Lagoon and Coastal Features

Mawella lagoon and its surrounding landforms have been altered by aeolian, marine and fluvial influences. The coastal front of the area is mainly comprised of wide curvature beaches and beach ridges with low dunes. Mangrove species occasionally occur at the narrow strip of the lagoon shoreline and around the nearby marshy areas.

The coastal environmental features at Mawella and Kudawella area make the coastline more scenic and varied than elsewhere in the southern region. The coastline comprises of bays, headlands, rock outcrops with cliff and points, as well as pocket beaches. The Kudawella blowhole, which is located at Kudawella headland, is one of the unique coastal features in the area and attracts many local and foreign visitors. The bay area located in Kudawella consists of pockets of unconsolidated sandy beaches and steep headlands.

FIGURE 6. LAND USE PATTERNS WITHIN THE MAWELLA AND KUDAWELLA SAMP



2.3 Demography

Mawella and Kudawella SAMP areas consists of 12 GN Divisions with 28 villages. (Annex 1). In 1998 there were 2310 families comprise 9656 persons living in these 12 GNDs. This figure represents about 13.2 percent of the total population in Tangalle DSD (DS, Tangalle 1999). The size of a household is between 3 and 4 persons.

The population density in the Mawella SAMP area is much higher than that of other areas of the Tangalle DS Division. In 1998, it was estimated that the population density in the Tangalle Division was 475 person per sq. km. Compared to these figures with the divisional level, Mawella SAMP area could be identified as the area with the highest population density within the DS Division (855 persons per sq. km). According to the figures given in Table 1, it is clear that Mawella south and Kudawella east are highly congested and densely populated compared with the other GNDs. This indicates a high risk of environmental degradation due to over exploitation of natural resources and high load of pollutants, especially solid waste, garbage and sewage.

TABLE 1 DISTRIBUTION OF POPULATION IN THE MAWELLA AND KUDAWELLA AREA IN 1998

| Name of the GN Divisiona | Total area of Each GND (ha) | Male | Female | Total | No. of Families |
|--------------------------|-----------------------------|-------------|-------------|-------------|-----------------|
| 283 Mahawella | 59.0 | 280 | 283 | 563 | 138 |
| 284 Phajjawa | 56.7 | 322 | 340 | 662 | 166 |
| 283 Nakulugamuwa (S) | 120.0 | 209 | 188 | 317 | 105 |
| 292 Mawella (N) | 17.4 | 312 | 327 | 639 | 135 |
| 293 Mawella (S) | 64.8 | 467 | 489 | 956 | 212 |
| 294 Morketiara (W) | 104.0 | 297 | 346 | 643 | 152 |
| 295 Morketiara (E) | 66.0 | 264 | 276 | 540 | 131 |
| i291 Kudawella (S) | 64.8 | 828 | 862 | 1690 | 380 |
| 290 Kudawella (C) | 32.4 | 469 | 462 | 931 | 216 |
| 289 Kudawella (N) | 64.8 | 449 | 446 | 895 | 205 |
| 287 Kudawella (E) | 28.3 | 436 | 469 | 905 | 224 |
| 288 Kudawella(W) | 63.0 | 457 | 458 | 915 | 246 |
| TOTAL | 741.2 | 4790 | 4946 | 9656 | 2310 |

Source: Divisional Secretary, Tangalle (1999)

2.4 Economic Aspects

The economy of the Mawella area is largely dependent on coastal and lagoon fishery resources. Fishing is the main source of income of the communities living in the vicinity of Mawella lagoon. Unlike in the coastal fishery, only non-mechanized canoes and traditional methods are used for lagoon fishery. According to the Resources and Economic Survey (DS, 1999 Tangalle) about 470 households in the Mawella area are engaged in coastal fishing. The details of the coastal fishing are given in Table 2.

TABLE 2 CHARACTERISTICS OF COASTAL FISHERY IN MAWELLA AREA

| | Year | | | | |
|-------------------------------|---------------|---------------|---------------|---------------|---------------|
| | 1994 | 1995 | 1996 | 1997 | 1998 |
| No. of anchorage | 1 | 1 | 1 | 1 | 1 |
| No. of boats | 150 | 162 | 175 | 183 | 196 |
| No. of Fishermen | 1050 | 1050 | 1060 | 1084 | 1084 |
| No. of fishing families | 450 | 458 | 460 | 470 | 470 |
| Annual production (kg) | 225100 | 229200 | 230184 | 332040 | 335800 |

Source: Divisional Secretary, Tangalle (1999)

However, field investigations revealed that the number of fishermen engaged in lagoon fishing is declining due to poor fishery resources in the lagoon. At present, there are only 28 non-mechanized small crafts engaged in lagoon fishery. In terms of spatial distribution, most of these non-mechanized crafts are operating from Pahajjawa, Kudawella (N) and Mawella (S) GNDs.

The homesteads and croplands particularly under coconut cultivation are quite sparsely used and can be seen in undulating low ridge and valley topography (30 - 150m) behind the coastal lowlands. In general, the paddy lands are rare, but some strips are located in Pahajjawa and Nakulugamuwa areas (Figure 2).

The economy of the Kudawella area (Kudawella South Central and North GND's) is almost totally dependent on the coastal fishery resources and the tourism activities connected with the bowhole. The fishing community in Kudawella east mainly depends on coastal fishing while a few households engage in lagoon fishing. About 2261 fisherman from 957 families are currently involved in coastal fishing. In 1998, a total of 522 fishing boats are operating in Kudawella area. (Tables 2 & 3)

TABLE 3 CHARACTERISTICS OF COASTAL FISHERY IN KUDAWELLA FO AREA

| KUDAWELLA AREA | YEAR | | | | |
|-------------------------|-------------|-------------|-------------|-------------|-------------|
| | 1994 | 1995 | 1996 | 1997 | 1998 |
| No. of anchorage | 2 | 2 | 2 | 2 | 2 |
| No. of boats | 419 | 441 | 460 | 491 | 522 |
| No. of Fishermen | 2002 | 2088 | 2158 | 2210 | 2261 |
| No. of fishing families | 847 | 867 | 907 | 937 | 957 |
| Annual production (kg) | 2417220 | 2378210 | 2908085 | 2929185 | 3020170 |

Source: Divisional Secretary, Tangalle (1999)

In addition to fishing, a large number of people are engaged in various other form of commercial and service activities at Kudawella blowhole (Katupotha, et al., 2000). Since the blowhole at Kudawella becomes popular as a scenic place, a number of people have changed their major employment to trading. According to the economic survey carried out in 1999, 35% of people who are engaged in business activities has come from other traditional occupations such as fishing, marine engine mechanics or trading activities elsewhere. This indicates that tourism is an attractive income for the people in the village.

3. CLASSIFICATION AND PRIORITIZATION OF MANAGEMENT ISSUES

3.1 Current Management Issues – Mawella Lagoon, Kudawella blowhole and related environs

The examination of the environmental social and economic scenario in Mawella and Kudawella special management area by the stakeholders resulted in the identification of a wide range of issues with potential impacts on the environment and the people. However, considering practicalities, implementation capacity, and the availability of resources, only those issues which have a high order of priority, and which require urgent management interventions have been selected for inclusion in the Plan; these are ten in number. To facilitate the planning process further, on the basis of their complexity and coherence, the ten issues have been grouped under the three major areas of concern viz. the lagoon the, blowhole and infrastructure. In order to facilitate discussion and to avoid confusion, the ten issues identified have also been grouped on the basis of the specific area they relate to ie. Mawella and Kudawella, as suggested by the stakeholders. Figure 6 presents a summary of the priority issues.

Infrastructure related issues have been grouped under a third item. This has been done since they are more or less common to both Mawella and Kudawella,.

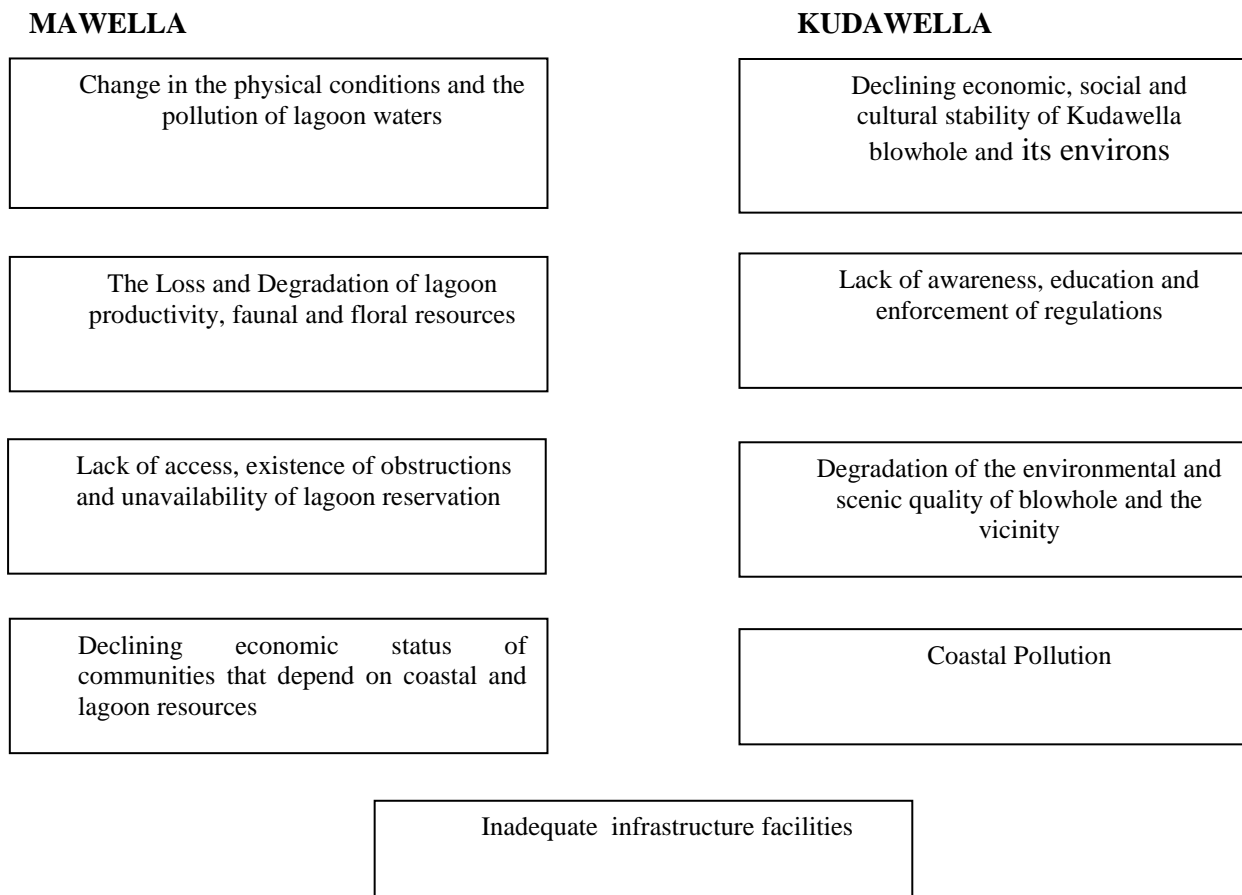
3.2 Key Management Issues - Mawella

3.2.1 Introduction

Mawella lagoon with its rich and diverse fish resources is reputed to have been one of the most productive lagoons in the southern coastal area in the past. The lagoon had been a part of a rich and productive ecosystem with the mangroves and associated vegetation round the lagoon providing a favorable habitat for many resident and migratory birds. Economically too, it was an important resource and an asset to the area since it provided sustenance to a large part of the fishing community in the area. The discussions with the elders of the village, those who had been engaged in fishing in the lagoon have revealed that the resources of the lagoon had been extracted in the past in a sustainable manner⁴. However, with the ecological and environmental changes over the years, the importance of the lagoon system as a source of income for the communities and as a habitat for several of bird species have declined. The bio-diversity of the lagoon has changed in response to the ecological and environmental changes. Though several attempts directed at the rehabilitation of the lagoon had been made by the central and local level agencies but have not been fruitful, probably due to missing involvement of the community and the stakeholders.

⁴ The field investigations and PRA sessions carried out in Mawella during the period between March-Dec.1999 disclosed that a number of self regulations have been practiced on lagoon fishing activities prior to 1956. These regulations were mainly directed on fishing seasons, species and the location.

FIGURE 7. KEY MANAGEMENT ISSUES



3.2.2 Change in the physical conditions and the pollution of lagoon waters

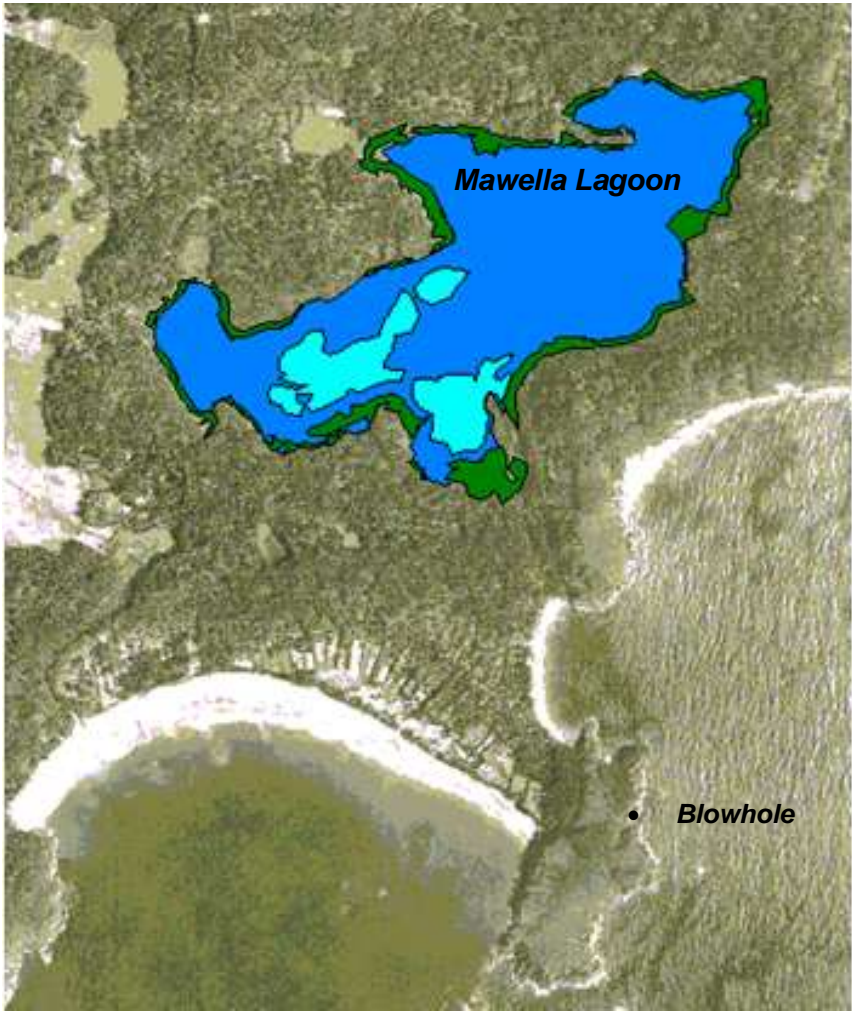
The physical condition of the Mawella lagoon has undergone changes due to man-induced as well as natural causes. According to 1956 and 1994 arial photographs and information gathered through community workshops it was revealed that the extent of the lagoon had an approximate area of 91 ha of water with diverse faunal and floral resources (Figures 7 & 8). The average depth of the lagoon ranged between 3-4 meters (Figure 9). Before mid 1950s, it was said to have been in a sound environmental condition with a high level of productivity. At present, the depth of the lagoon has been drastically reduced and ranges between one (1) and three (3) meters. Moreover most parts of the lagoon are covered with aquatic plants, weeds and silt. The brackish water environment has got transformed nearly into a fresh water environment and a most marine and brackish water species of fish have disappeared. The same fate has befallen on some of the mangrove species. These changes coupled with the high rate of population growth have resulted in a number of social, economic and environmental problems leading to unsatisfactory living conditions and increased poverty among the communities in Mawella.

According to the findings of the investigations and the perceptions of the stakeholders, the main causes leading to physical changes and the loss of the ecological balance in the lagoon are the:

- Loss of the regular connection between the sea and the lagoon,
- Unauthorized filling along the lagoon banks,
- Growth of aquatic weeds in the lagoon,
- Retting of coconut husk for the extraction of white fiber

The absence of a regular connection between lagoon and the sea to permit the two-way flow of water is a major cause that has affected the physical condition of the lagoon. The existing physical setting of the Mawella lagoon is comprised of fourteen (14) inlets (culvert) and one (1) outlet (canal). During the monsoon period, a limited quantity of fresh water enters the lagoon through the 14 inlets located around the lagoon⁵.

FIGURE 8. ARIAL VIEW OF THE MAWELLA LAGOON IN 1956



- Mangrove fringes
- Shallow water area with aquatic plants
- Water area

⁵ The main sources of water into the lagoon enter through 14 small drainage inlets/waterways located around the lagoon. According to existing information, functioning of these inlets can be seen only in monsoon periods.

FIGURE 9. ARIAL VIEW OF THE MAWELLA LAGOON IN 1994

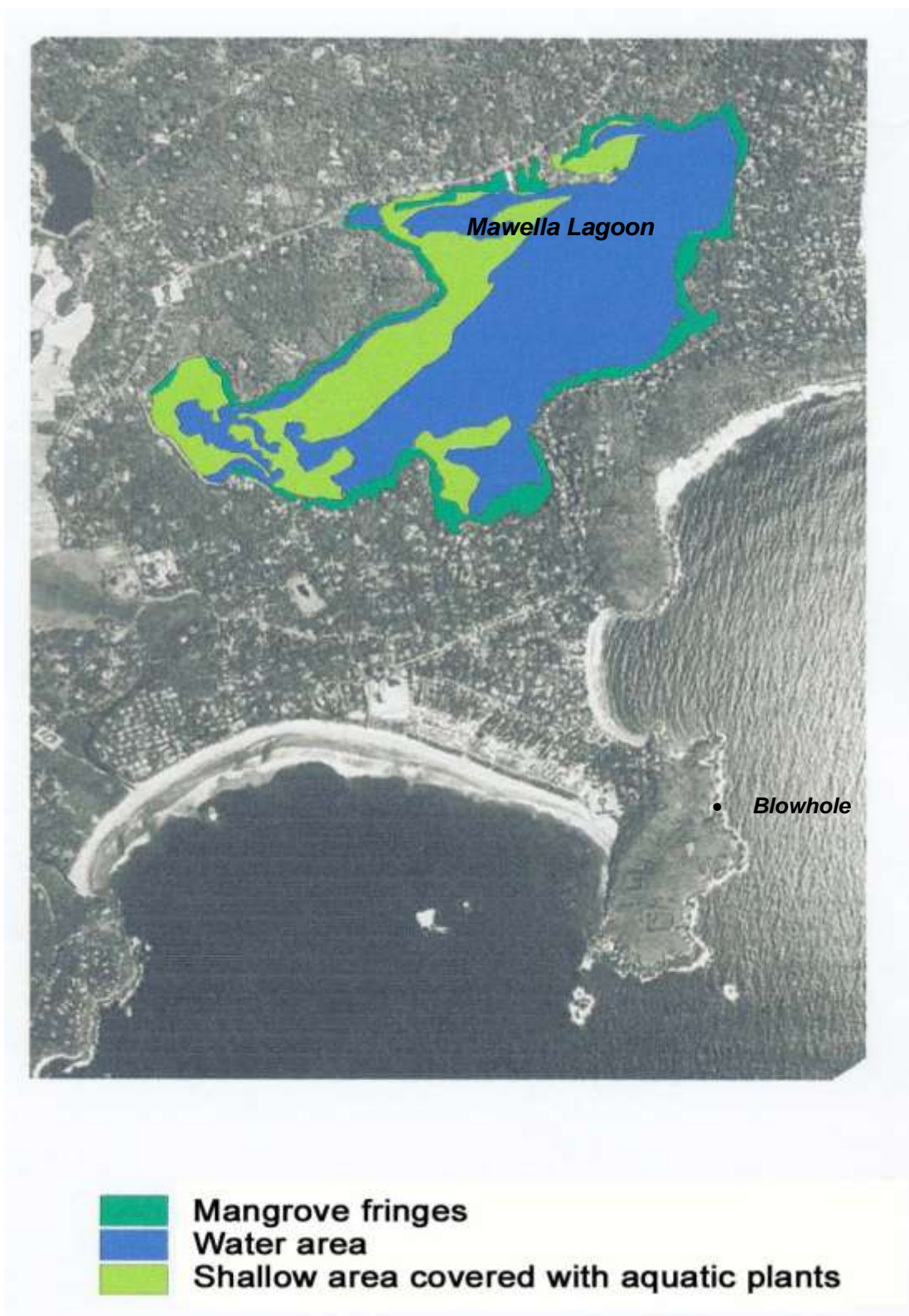
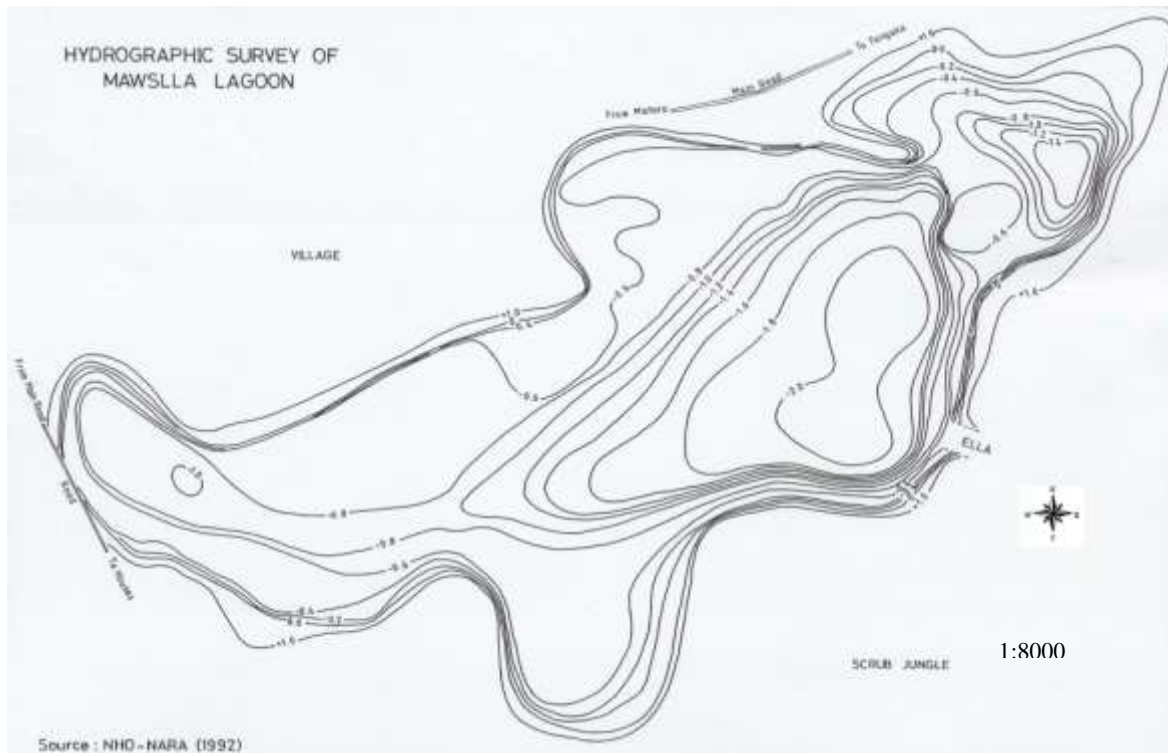


FIGURE 10 HYDROGRAPHIC SURVEY MAP OF THE MAWELLA LAGOON



A canal, approximately 700 meters long, located on the southeastern side of the lagoon has been the link connecting the lagoon with the sea. However, due to a combination of natural as well as manmade causes, the connection between the sea and the lagoon has been completely cut off during the past few years. As a direct result of this, a number of environmental consequences such as low salinity levels in the lagoon waters (3.1ppt.) and frequent floods during the monsoon season have been experienced (NARA, unpublished). The low levels of salinity have created a fresh water environment in the lagoon thereby promoting the spread of a large quantity of fresh-water weeds in the lagoon. It has also been found that the low level of salinity has created an unhealthy environment for shrimps and euryhaline fish species. Due to these changes the effective water area and the resources profile of the lagoon has got changed.

Indiscriminate encroachment of lagoon waters by means of land filling is another significant factor that has contributed to physical changes in the Mawella lagoon. High rates of population growth and the scarcity of land have pushed the people to the point of encroaching the lagoon waters to extend their existing limited land area or bring into existence new land by means of filling. These landfills have been effected with the earth or domestic waste. Incidence of encroachment of lagoon waters is an acute problem particularly in the GN Divisions of Mahawela and Mawella West. In the absence of proper lagoon boundary demarcations and lack of awareness on the harmful impact of this activity, encroachments and land filling have increased rapidly during the recent past. As a direct result, the effective water area of the lagoon has been significantly reduced.

Although pollution is one of the critical issues identified, the studies that have been carried out have not properly quantified the extent of pollutants and the data available is insufficient to make a reliable estimate of the magnitude of pollution levels in Mawella Lagoon. However, according to available information, Mawella lagoon and its surroundings area has shown signs of pollution by anthropogenic effects. The major types of pollutants are domestic sewage, wastewater and solid wastes. A number of dwellings that are located close to the lagoon emit their sewage directly into the lagoon. Beside direct disposal,

approximately seventy five households who do not possess proper latrine facilities are reported to be using the lagoon banks and the water area as toilets. Similar to other high-density human settlements with no proper sewage disposal, Mawella lagoon is also confronted with the problem of organic pollution. Since human waste is rich in nutrients it promotes growth of algae, which is food for harmful organisms such as mosquitoes.

Besides discharge of sewage, disposal of solid waste and wastewater into the lagoon and the canal is a common practice in Mawella. In addition, coconut retting taking place at the edge of the lagoon, particularly in Mawella South GN Division and in the canal, is also a contributory input of carbon pollution. This activity may lead to low levels of dissolved oxygen due to the release of carbon.

3.2.3 The Loss and Degradation of lagoon productivity, faunal and floral resources

Depletion of the faunal and floral resources in the lagoon and the reduced productivity is one of the most significant issues prevailing in Mawella. Prior to the occurrence of physical changes in the lagoon and introduction of *Oriochromis mosambicus* an exotic species, the productivity of the lagoon was at a much higher level (PRA, March, 1999). The information collected during the course of the PRA revealed that there were about 27 fish species in the lagoon. The common fish and crustacean species found in the lagoon in the past are considered brackish/marine fish varieties (Table 4).

In addition to a diverse range of fish and crustacean species found in the lagoon in the past, a fair number of mangrove species were also found (Annex 3.3A & 3.3B). However at present the extent and diversity of mangroves have decreased. A limited number of true mangroves and associates exist at present (Table 5)

TABLE 4 COMMON FISH AND CRUSTACEAN SPECIES FOUND IN MAWELLA LAGOON PRIOR TO 1950

| Local Sinhala Name | Scientific Name |
|---------------------------|----------------------------------|
| Batayo | <i>Pomadasis sp.</i> |
| Korali | <i>Chaetodon suratensis</i> |
| Olayo | <i>Pertica filamentosa</i> |
| Dhallu | <i>Lutianus argentimaculatus</i> |
| Parati | <i>Carnax sp.</i> |
| Anda | <i>Anguilla Anguilla</i> |
| Kawaiya | <i>Anapas testudines</i> |
| Marando | <i>Hemiramphu sp.</i> |
| Niloti | <i>Caridina nilotica</i> |
| Karaandu issa | <i>Penaens monodon</i> |
| Kiri issa | <i>Penaens merguensis</i> |
| Kunissa | <i>Penaeus inducus</i> |
| Vahareli | <i>Chaetodon argus</i> |
| Anguluwa | <i>Arens caelatus</i> |
| Ilayo | <i>Scatophagus argus</i> |

| | |
|-------------|--------------------------------|
| Wekku | <i>Chanos chanos</i> |
| Renava | <i>Elops machnata</i> |
| Madara | <i>Ophiocephalus punctatus</i> |
| Katilla | <i>Therapon sp</i> |
| Teliya | <i>Sphyraena obtusata</i> |
| Koduwa | <i>Angnilla sp.</i> |
| Lagga | <i>Engraulis sp</i> |
| Weligowwa | <i>Glossogobins giuris</i> |
| Olayo | <i>Gerres oblongus</i> |
| Isbaryo | <i>Mujil sp.</i> |
| Bandigediyo | <i>Mujil sp</i> |

Source: Data collected from the interviews with the local fisherman & PRA (1999)

TABLE 5. TYPES OF MANGROVE & ASSOCIATE SPECIES AROUND THE MAWELLA LAGOON (1999)

| Sinhala Name | Scientific Name |
|-----------------------|--|
| Thillan (Telakeeriya) | Excoecaria aggallocha (Eupharbiaceae) |
| Kirala | Sonneratia spp. |
| Indi | Phoenix zeylanica (Palmae) * |
| Kadol | Avicinnia spp. (Aviceniaceae) |
| Danga (diyadanga) | <i>Dolichandrone spathacea</i> |
| Ikiriya | Acanthus ilicifolius (Acanthaceae) |
| Kalawel | Derris scandens (Leguminoceae)* |
| Wewœl | <i>Calamus rotang</i> * |
| Kerankoku | <i>Acrosticbun aureun</i> (Pteridaceae) |
| Weraniya | <i>Hedyotis fruticosa</i> (Rubiaceae)* |
| Wal Beli | <i>Hibiscus tiliaceus</i> (Malaaceae) * |
| Sooriya | <i>Thespersia populnea</i> (Malvaceae) * |
| Hiramana | <i>Punica granatum</i> * |
| Hambu | <i>Typha angustifolia</i> (Typhaceae)* |

- Mangrove associates

Source: Field observation & PRA, 1999

While mangrove communities continuously declined in the lagoon area, a large number of other aquatic plants have been spread in the lagoon (Table 3.4). The types of such vegetation found in the lagoon at present clearly indicates the extent of the changes occurred in the lagoons salinity regime.).

TABLE 6. AQUATIC PLANTS OF THE MAWELLA LAGOON

| Local Sinhala Name | Scientific Name |
|--------------------|--|
| Katupenda | <i>Najas maina</i> |
| Lunuwila | <i>Bacopa monniera</i> (Scrophulariaceae) |
| Olu | <i>Nimphoides indica</i> (Gentianaceae) |
| Kekatiya | <i>Pygeum zeylznicum</i> (Rosacea) |
| Jabara | <i>Eichhornia crassipes</i> (Pentederiaceae) |
| Diya Siyambala | <i>Aechynomene indica</i> (Leguminosae) |
| Beru gas | <i>Indigofera tinctoria</i> |

Source: Field observation & PRA, 1999

Apart from fish, crustaceans and vegetation, a large number of reptiles, amphibians and bird species, also existed in the lagoon (Tables 3.5 and 3.6). A few numbers of terrestrial faunal species are also found within the immediate environment of the Mawella Lagoon.

TABLE 7. REPTILES AND OTHER ANIMALS FOUND IN THE MAWELLA LAGOON AND THE VICINITY(1999)

| Local Sinhala name | Scientific name |
|--------------------|-------------------------------------|
| Kabaraya | <i>Varanus salvator</i> |
| Katussa | Genus: <i>Caletos</i> |
| Ibba (kiri) | <i>Lissemys punctata granosa</i> |
| Ibba (gal) | <i>Melanochela trijuga themalis</i> |
| Diya naya | <i>Natrix piseator asperrimus</i> |
| Diya polanga | <i>Natrix piseator asperrimus</i> |
| Kunakatuwa | <i>Agkistrodon hypnale</i> |
| Mapila | <i>Boiga fortent</i> |
| Naya | <i>Naja naja naja</i> |
| Aharakukka | <i>Natrix stolata stolata</i> |
| Hal danda | <i>Dendrelaphis bifrenalis</i> |
| Ahetulla | <i>Ahaetulla nasuta nasuta</i> |

Source: Data collected from the interviews with the local fisherman (1999).

TABLE 8. RESIDENCE AND MIGRATORY BIRD SPECIES FOUND IN THE MAWELLA LAGOON AREA

| Local Sinhala Name | Common Name | Scientific Name |
|-------------------------|-------------------------|--|
| Sudu medi-koka | Intermediate Egret | <i>Mesophoyx intermedia</i> |
| Pala-koka | Little Heron | <i>Butoridesstratus</i> |
| Kana-koka | Pond Heron | <i>Ardeola grati</i> |
| Punchi Eli-koka | Little Egret | <i>Egretta garzetta</i> |
| Muhundulihiniya | Little tern | <i>Sterna sp.</i> |
| Kirala | Lapwing | <i>Vanellus sp.</i> |
| Kalupiya Ipalpava | Black-winged Stilt | <i>Himantopus himantopus</i> |
| Punchi Diyakawa | Little Cormorant | <i>Phalacrocorax niger</i> |
| Indu Diyakawa | Indian Shag | <i>Phalacrocorax fuscicollis</i> |
| Layasudu Korawakka | White-breasted waterhen | <i>Amanroruis phoenicurus</i> |
| Ahikawa | Darter | <i>Anhiga melanogaster</i> |
| Podu Dam-kitala | Purple swamphen | <i>Porphyria poliocephalus poliocephalus</i> |
| Manatudu MediPilihuduwa | Stork-billed kingfisher | <i>Halcyon capencis</i> |
| Paththaya | Greylag Goose | <i>Anser anser</i> |
| Mal-seruwa | Cotton Pygmy-goose | <i>Nettapus coromandeleianus</i> |
| Silibillo | Sandpiper | <i>Tringa sp.</i> |

Source: Field observation, 1999

According to senior residents involved in the PRA indicated that, fishermen were able to harvest a large quantity of fish from the lagoon in 1940's. However, 1993 estimates reported that over 30,000 kg of fish (100 or more kg/per day) had been produced from the lagoon (Jayakody, 1993). At present, it has dropped to around 50 kg/per day. It is also reported that fishing effort has dropped drastically. According to Mawella fishing community approximately 150 non-mechanized crafts used to be engaged in fishing in late 1940's. At present this amount has dropped to 29. However, with the depletion of productivity and change of floral diversity, numerous environmental social and economic consequences have become visible in the area.

The findings of the investigations revealed that the lagoon productivity and resource depletion has occurred over the years due to a combination of several factors such as;

- Drop in the salinity levels
- Over exploitation of resources
- Use of destructive fishing gear and methods
- Degradation of fish aggregating aquatic plants
- Spread of fresh water weeds

In addition to low level of salinity, spreading of aquatic weeds, such as Katupenda (*Najas marina*) in large quantities has disrupted the ecological balance of the lagoon system (Annex 3.3A). Moreover, the siltation and sedimentation process that occurs mainly due to run off from high ground areas and decomposition of aquatic weeds in the lagoon has reduced the lagoon volume/area and adversely affected the productivity.

Due to the disruption of the water exchange between the sea and the lagoon, the two way fish movement has been obstructed thus affecting the incomes of the lagoon fishermen leading to their impoverishment. One other major negative impact has been on the bio-diversity of the lagoon.

3.2.4 Lack of access, existence of obstructions and unavailability of lagoon reservation

The outer boundary (bank) of the Mawella lagoon is approximately 15 km, in length and it traverses through six GN Divisions. Inadequate free access to the lagoon is another significant issue associated with Mawella lagoon management. This problem is further aggravated due to non-appearance of lagoon reservation or buffer zone. In terms of fishing, recreational and other lagoon uses, proper access is one of the priority requirements.

In the past there had been an adequate level of access available for fisheries related activities when the peripheral area of Mawella lagoon is free from development. When there were no housing development around the lagoon, fishermen were able to reach the lagoon through most of the private properties.

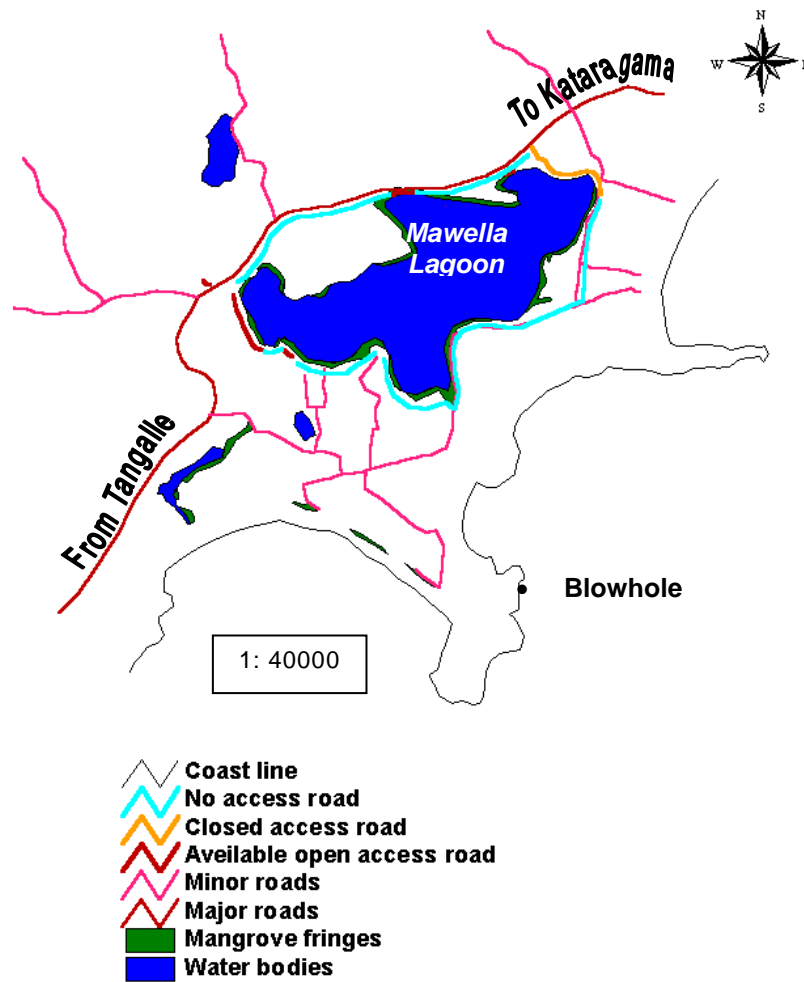
The 1923 village plan of the area clearly shows free access to the lagoon from the areas such as along the Tissa–Matara road and the road traverses through Mawella village towards Kudawella. The established vertical access points available in 1923 are given in Figure 5. However, with the rapid growth of population, private ownership of lagoon-bounded properties, fragmentation of land and encroachments most of these access points have disappeared.

In the absence of proper lagoon reservations, most of the lagoon-bounded properties have been expanded and extended through encroachment by means of filling and fencing due to the rapid growth of the population and the consequential land fragmentation. Thus the private land ownership right round the lagoon has created problems in providing access. In terms of availability of lagoon access at present, adequate access are found only in western side of the lagoon through the narrow land strip between the gravel road and the lagoon. In view of the development potential of the lagoon for fisheries, eco-tourism and recreational and other uses, adequate access to the lagoon is imperative.

3.2.5 Declining economic status of communities that depend on coastal and lagoon resources

The seven GN divisions bounded by the Mawella lagoon has 1039 families comprising 4320 population. Their main source of income is coastal or lagoon fishery and the related activities. The socio-economic survey conducted in 1999 revealed that approximately 63 percent of the employed population in SAM area is either directly or indirectly engaged in fisheries and related activities. Of the others, approximately 10 percent are engaged in small-scale business or trade related activities while 9 percent are engaged in coconut retting and white fiber production. The rest are employed in the public sector institutions or private enterprises as clerks, teachers and in similar capacities, while the others belongs to the category of security services and unspecified categories.

FIGURE 11. LOCATION OF ACCESS ROADS WITHIN THE MAWELLA AND KUDAWELLA SAMP AREA



Although the fishing is the dominant occupation in the SAM area, people engaged in a number of other occupations also. However, the percentages of people engaged in such income generating activities are small in number. The following table illustrates the number of people engaged in other occupations in lagoon bounded GN Divisions. (Table 9)

TABLE 9. THE TYPES OF EMPLOYMENT ENGAGED BY COMMUNITY LIVING IN THE SAMP AREA

| G.N. Division | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | Total |
|---------------------|-------------|------------|------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-------------|
| 1. Moraketiara (W) | 152 | 15 | 04 | 05 | 02 | 03 | 00 | 01 | 01 | 00 | 01 | 184 |
| 2. Mawella (N) | 135 | 13 | 06 | 08 | 02 | 00 | 00 | 01 | 00 | 00 | 00 | 165 |
| 3. Pahajjawa | 166 | 16 | 11 | 13 | 02 | 01 | 03 | 00 | 00 | 00 | 00 | 212 |
| 4. Kudawella (W) | 246 | 20 | 24 | 03 | 01 | 00 | 00 | 00 | 00 | 00 | 00 | 294 |
| 5. Mahawela | 138 | 13 | 01 | 00 | 06 | 03 | 00 | 01 | 00 | 00 | 00 | 162 |
| 6. Moraketiara (E) | 131 | 12 | 07 | 01 | 01 | 00 | 00 | 03 | 02 | 01 | 00 | 158 |
| 7. Kudawella (E) | 224 | 22 | 18 | 09 | 01 | 00 | 00 | 00 | 00 | 00 | 00 | 274 |
| 8. Mawella (S) | 212 | 21 | 19 | 07 | 01 | 00 | 01 | 00 | 00 | 01 | 00 | 262 |
| 9. Nakulugamuwa (E) | 110 | 10 | 01 | 00 | 02 | 02 | 01 | 00 | 00 | 00 | 01 | 127 |
| 10. Kudawella © | 216 | 21 | 19 | 02 | 00 | 00 | 01 | 00 | 00 | 00 | 00 | 259 |
| 11. Kudawella (N) | 205 | 20 | 06 | 09 | 02 | 01 | 00 | 00 | 00 | 00 | 00 | 243 |
| 12. Kudawella (S) | 380 | 37 | 29 | 11 | 00 | 00 | 02 | 00 | 00 | 00 | 00 | 459 |
| Total | 2315 | 220 | 145 | 68 | 20 | 10 | 08 | 06 | 03 | 02 | 02 | 2799 |

(1) = Number of households

(2) = Sample size

(3) = Fishing

(4) = Roping

(5) = Trading

(6) = Clerk

(7) = Pensioners

(8) = Teacher

(9) = Carpenter

(10) = Mechanic

(11) = Farmer

Source: Socio-economic Survey, 1999.

With high population density (1437 per sq. km), low land-man ratio (1: 0.02 ha), the almost non-existence of opportunities to engage in agriculture or industry the communities in Mawella have to continue to depend heavily on coastal and lagoon fishery resources. Due to the rapid increase in the number of inshore fishing boats, the decline of the madel fishery, intense competition and resource user conflicts among the fishermen, the application of destructive fishing gear the capacity of the inshore/coastal fishery to absorb more fishermen is almost non-existent. This is significant in the light of the fact that unemployment ratio in the SAMP area is high. It is approximately 17.5% of the total labour force. This is higher than the unemployment rate of the labour force reported (14.3%) in the Tangalle Divisional Secretariat Division.

At present, the average income from lagoon fishery is a very low situation. The reported daily per-capita income from lagoon fishery is said to be in the range of between Rs.30 rupees to Rs. 100 (Jayakody, 1993). It is also important to note that the income distribution inequalities are high in lagoon bounded GN Divisions. Approximately 20.9% of household have a monthly income of less than 2000 rupees, while 19% household earns more than 5000 rupees (Table 10).

TABLE 10. INCOME LEVELS OF THE SAMP AREA

| G.N. Division | (1) | (2) | <1000 | 1000-2 | 2000-3 | 3000-4 | 4000-5 | >5000 | Total |
|----------------------|-------------|------------|-----------------|---------------|---------------|---------------|---------------|-----------------|--------------|
| 1. Moraketiara W | 152 | 15 | 03 | 01 | 01 | 03 | 02 | 05 | 15 |
| 2. Mawella N | 135 | 13 | 00 | 03 | 00 | 02 | 06 | 02 | 13 |
| 3. Pahajjawa | 166 | 16 | 03 | 00 | 06 | 01 | 03 | 03 | 16 |
| 4. Kudawella W | 246 | 20 | 00 | 00 | 02 | 05 | 05 | 08 | 20 |
| 5. Mahawela | 138 | 13 | 01 | 03 | 02 | 02 | 04 | 01 | 13 |
| 6. Moraketiara E | 131 | 12 | 00 | 01 | 00 | 01 | 05 | 05 | 12 |
| 7. Kudawella E | 224 | 22 | 00 | 06 | 08 | 03 | 00 | 05 | 22 |
| 8. Mawella S | 212 | 21 | 00 | 04 | 06 | 05 | 03 | 03 | 21 |
| 9. Nakulugamuwa E | 110 | 10 | 00 | 01 | 03 | 04 | 01 | 01 | 10 |
| 10. Kudawella C | 216 | 21 | 01 | 01 | 02 | 09 | 06 | 02 | 21 |
| 11. Kudawella N | 205 | 20 | 03 | 03 | 10 | 02 | 01 | 01 | 20 |
| 12. Kudawella S | 380 | 37 | 05 | 07 | 11 | 03 | 05 | 06 | 37 |
| Total | 2315 | 220 | 16 | 30 | 51 | 40 | 41 | 42 | 220 |
| Percentage | | | 7.3% | 13.6% | 23.2% | 18.2% | 18.6% | 19.1% | 100 |

(1) No. of households, (2) = sample

Source: Socio-economic Survey, 1999.

The high rate of unemployment, low level of income and less earnings from lagoon and coastal resources indicate importance of diversification and creation of alternative income generating avenues.

3.3 Key management Issues - Kudawella

3.3.1 Introduction

The key management issues that have been identified in Kudawella area are more or less focused on the blowhole and related environs (Annex 3.6A). Although the issues such as public safety (Annex 3.6B), dumping of solid waste, unauthorized constructions, destruction of coastal vegetation, inadequate public access, user conflicts and lack of drinking water are specific issues, no attempt was made to discuss these aspects separately in this plan. However, as proposed by the stakeholders and with the consensus of all other agencies it was decided to cover these aspects under broad issues as described in the following section.

3.3.2 Declining economic, social and cultural stability of Kudawella blowhole and its environs

In terms of ethnicity the population of Mawella and Kudawella areas contain 100 percent Sinhala Buddhists. According to historical evidence, there were no marked cultural or social problems in the past when Mawella and Kudawella remain as traditional coastal villages (Alexander, 1997). However, with the rural transformation, a number of social and cultural consequences were become visible in the recent past. The rapid rate of population growth, urbanization, and other developments within the villages has led to a deterioration of their traditional values and norms. Drugs, alcohol and other abuses have spread through the villages thereby creating negative social impacts.

In addition, with the popularization of the blowhole, a number of social conflicts have emerged between villagers and visitors. The occasional grudges between these groups have adversely affected the social harmony and tend to extend ill treatment to the visitors continuously. This situation was further aggravated owing to low level of education and poor level of schooling in the SAMP area. In view of the above, it is

an outstanding issue to minimize declining of cultural and social stability in Mawella and Kudawella SAMP area.

3.3.3 Lack of awareness, education and enforcement of regulations

Public awareness, education together with effective enforcement is necessary conditions for favorable natural resource management. In terms of positive coastal resource management within the SAM area, the current level of public awareness, education and enforcement of rules and regulations are lacking. Hence, a number of issues leading to coastal resource degradation have emerged in the area. These issues are associated with loss and degradation of bio-diversity, increased pollution, over harvesting of fisheries resources, destructive fishing practices and unauthorized constructions that can be seen in the coastal zone.

In the absence of meaningful system for coastal resource management, these issues have accelerated in the past. Thus, the impacts of such issues have negatively affected the wellbeing of the communities.

3.3.4 Degradation of the environmental and scenic quality of blowhole and the vicinity

The blowhole located at Kudawella coastal promontory is one of the unique coastal features popular among local and foreign visitors. According to a recent estimate, the annual visitation rate is approximately 375,000 consisting of both locals and foreign tourists. According to the investigations carried out on economic significance of the blowhole, it was found that the economic potential of this site is enormous. The annual recreational value of the blowhole has been calculated around Rs.10 million in terms of 1998 prices using the travel cost method.

At present, the blowhole and its immediate environs have encountered a number of environmental, social and economic issues. Dumping of solid waste, unauthorized constructions, destruction of coastal vegetation, inadequate public access, public safety, user conflicts and lack of drinking water are most the important issues in connection with the blowhole and its immediate environs.

With the increasing rate of visitors to the blowhole area, the amount of solid waste generated in the form of plastic, paper and non-biodegradable materials also increase rapidly increased. The natural scenic beauty of the blowhole and its immediate environment is decreasing due to ongoing ad-hoc construction activities. Parallel to increasing visitor rate, people in the area tend to construct buildings for commercial ventures. The inadequate accesses to the blowhole cause sever problem for large number of visitors. As a result of narrow road network, traffic congestion is a common problem that can be seen especially in weekend and holidays. The existing footpath runs to the blowhole traverses through private properties posed difficulties and conflicts between users and the property owners. Public safety is another issue related to blowhole. A number of fatal accidents have been reported in the recent past at the blowhole site. Since there is no safety fence at the edge of the cliff on the seaside of the blowhole, visitors attempt to reach that area without knowing the danger. When the high waves approach the edge of the cliff, people cannot escape from drowning to the sea. During the past two years the number of reported accidental deaths are approximately 10 persons.

3.3.5 Coastal Pollution

Coastal pollution is one of the prime concerns in Mawella and Kudawella SAM area. The natural coastal environment and its resource base in Mawella and Kudawella area are now confronted with a number of problems due to uncollected solid waste and the discharge of oil into the coastal waters. Solid waste in the SAM area is mainly generated by the large number of visitors to the blowhole, the households, commercial establishments and in the course of fishing and fishing related activities. A total of 2,693 households with a population of 10,388 generate solid waste in the SAM area. Apart from the households, over 1,000 local and foreign tourists who visit the blowhole daily dump solid waste indiscriminately.

The solid waste which, accumulate in the SAM area comprises both biodegradable and non-biodegradable materials. Biodegradable materials mainly consist of food and households refuse while the non-biodegradable materials are in the form of plastic, and polythene. In the absence of proper waste collection systems solid waste disposal has emerged as a critical issue in the area. There is however no quantitative information either on the level of oil pollution in the coastal waters, or its impacts on marine resources in the Mawella and Kudawella areas. This has to be determined and quantified through future studies.

In view of the fact that a large number of mechanized fishing crafts operating in the area without proper waste oil reception facilities, the levels of oil discharge into the near shore areas appear to have assumed significant proportions. This situation is likely to get further aggravated in the future with the opening of the new fishery harbour at Kudawella unless proper measures are taken to cope with this issue.

3.3.6 Inadequate infrastructure facilities in Mawella and Kudawella

The GN divisions which, come under the SAM area do not have adequate infrastructure compared with the needs considering the high population densities in the area. These inadequacies specifically become evident concerning water supply and sanitary facilities, roads , transport network and communication.

Inadequate potable water is one of the critical problems not only in Mawella and Kudawella areas but also in the entire Tangalle Division. At present, the main source of drinking water is the supply provided by the National Water Supply and Drainage Board through the roadside stand pipes and direct household connections. However a regular water supply is not available throughout the day owing to inadequate supply. The present water supply is confined to 4-6 hours per day. The water supply to Mawella and Kudawella villages is provided through the Matara water supply scheme and the main storage tank located at Dickwella distributes water to these villages. Because of the high salinity levels the ground water available in the area is not suitable for drinking.

The socio-economic survey (1999) revealed that approximately 69% of the total household within the SAMP area do not have proper drinking water facilities. Investigations also reveal that the demand for drinking water in the SAMP area would increase very considerably in the near future with the commissioning of the new fisheries harbour at Kudawella and with increasing rate of visitors to the blowhole. In the absence of new water supply schemes in the area, this situation will create more problems for the residents in the future. Hence, in addition to initiating new water supply schemes it is also necessary to pay attention on water management as well.

The social and economic development in the SAMP area has been constrained by the inadequate and sub-standard road network existing at present. Some of these roads are badly damaged, not properly maintained and hence not vehicle worthy. In view of the current uses and ongoing development activities in the area, the available access facilities to these areas are insufficient. Approximately 375,000 to 400,000 visitors visit Kudawella blowhole annually through the existing roads. With the new fishery harbour development, the intensity of these uses will further increase. Hence, it is important to improve quality of existing road network to cater to the current and the future demand.

The lack of proper communication facilities is another issue identified by the stakeholders. The lack of telephones, faxes and other communication facilities at present hampers the economic and social development of the area and this merits early attention.

4. STRATEGIES AND MANAGEMENT ACTIONS FOR IMPLEMENTATION

4.1 MAWELLA

Issue: Change of physical conditions and the pollution of lagoon waters

4.1.1 Objectives and Policies for Management:

The environmental condition and the economic potential of Mawella lagoon will further decline and sustainable resource utilization will be further threatened in the long run unless the problems relating to the pollution of the lagoon and the change of physical conditions are not addressed. In this regard the Mawella Coordinating Committee (MWCC) and all other relevant stakeholders agreed upon the following management objectives

- Reduce the existing pollution to the minimum level and thereby to create a healthy lagoon environment for the benefits of the community at large
- Enhance the productivity of the lagoon by restoring/rehabilitating connection between the sea and the lagoon to allow the free flow of water.
- Control/reduce the inflow of sediments and other waste into the lagoon and the canal system
- Minimize risk of floods that frequently experienced during the rainy season

The following policies are adopted to achieve the objectives with the consensus of MWCC, Department of Fisheries, DS, DI

- Ensure the proper functioning of the connection between the sea and the lagoon
- Introduce and promote technically sound financially viable programme for canal rehabilitation
- Curtail discharge and dumping of all kinds of waste into the lagoon and the canal system from dwellings and other commercial establishments
- Control coconut retting in the lagoon by identifying alternative location for the white fiber industry.

4.1.2 Strategies and Actions for Pollution and Water system management in the lagoon

Strategy 1

Establish the permanent connection between lagoon and the sea by initiating following activities

Actions

- Deepening of canal to a required depth to facilitate the water exchange between sea and the lagoon
- Removal of any existing obstructions/ impediments and the establishment of canal boundaries with proper signs.
- Lining the canal banks to prevent erosion/collapse
- Proper maintenance of existing drains and the construction of new drains if necessary to prevent siltation of the canal
- Conduct necessary investigations for construction of any outfall structures necessary to keep the canal mouth open

- Conduct community awareness and education campaign for proper maintenance of the canal
- Establish a working committee consisting relevant stakeholders to ensure the proper management of the canal

Strategy 2

Dredging of silted areas of the Lagoon based on sound technical investigations

Actions

- Determine and demarcate areas and the extent of dredging necessary to improve the condition of the lagoon
- Prepare Environmental Impact Statement to determine positive and negative effects of dredging
- Establish a lagoon monitoring plan that could be implement with community participation

Strategy 3

Prevent sewage discharge into the lagoon/canal and provide technical advice/assistance to maintain existing septic systems.

Actions:

- Identify exact point sources of such discharges and inform properly the parties concerned of the need to prevent discharges.
- Provide financial/technical assistance to construct new latrines for dwellings located in close proximity to the lagoon and/or canal banks.
- Enhance coordination among government, non-government agencies and the communities to obtain necessary funds to provide financial assistance
- Conduct public awareness and education campaign to create awareness among communities to maintain quality of the lagoon waters

Strategy 4

Introduce lagoon/canal water monitoring system.

Actions:

- Formulate lagoon water quality monitoring system with the help of NARA Regional Research Center at Rekawa and University of Ruhuna
- Mobilize school children to carry out monitoring activities
- Establish sustainable financing mechanism for long term monitoring activities

4.1.3 Objectives and policies for management of faunal and floral resources

Issue : Degradation of faunal and floral resources and decline in the productivity of the lagoon

The main objective of the management of the productivity of faunal and floral resources of Mawella Lagoon and the immediate coastal environs are to:

- Transform the current low productive state of the lagoon to a high productive state which had prevailed in the past
- Maximize the social, economic and environmental benefits from the lagoon by enhancing and conserving faunal and floral resources

- Ensure sustainability of conservation and management interventions through maximizing community participation

The policies, which were agreed upon by the MCC to achieve the above objectives are to:

Ensure maintenance of the maximum extent of the water area of the lagoon
 Improve and maintain the quality of the water in the lagoon and the canal
 Prevent reclamation or siltation in the lagoon
 Promote necessary research and investigations to ensure replenishment of commercially and environmentally viable fish and crustacean species in the lagoon
 Promote mangrove re-plantation at suitable location and conserve bird life and wildlife resources
 Prohibit the use of harmful and resource destructive fishing methods and gear in the lagoon
 Promote/encourage sustainable eco-tourism integrated with Kudawella Blowhole development to generates economic benefits to the local community

Strategy 1

Establishment and maintenance of lagoon boundaries

Actions:

- Conduct survey and prepare plans indicating legal boundaries
- Demarcate lagoon boundary by installing suitable signs (eg. Negombo Lagoon boundary demarcation)
- Prevent further encroachment by enforcing regulations
- Conduct awareness programmes highlighting the necessity of maintaining lagoon water area

Strategy 2

Ensure proper functioning of the canal to maintain salinity levels and curtail solid and/or other form of waste discharges into the lagoon waters or into the canal

Actions

- MCC should take necessary action to keep the canal mouth open by removing the sand bar at the canal mouth manually
- Proper maintenance of fourteen inlets located around the lagoon
- Prohibit the use of plastic and polythene items in all activities proposed under “eco-tourism development”
- Prohibit the use of mechanized fishing/recreational vessels in the lagoon

Strategy 3

Preparation and implementation of an action plan for managing surface water runoff and natural siltation due to aquatic weeds

Actions

- Construct silt traps for the fourteen water inlets located around the lagoon
- Investigate the status of soil erosion due to agricultural practices on hill slopes adjacent to the lagoon and provide technical assistance to prevent soil erosion Remove aquatic weeds such as *Najas marina* (Katupenda) which contributes to natural siltation

Strategy 4

Initiate a programme to recruit commercially and environmentally viable fish and crustaceans into the lagoon

Actions

- Conduct investigation to determine process of recruitment of suitable fish , shrimp larvae and crabs with the assistance of NARA and RU
- Allocate suitable area from the lagoon and carry out a pilot project with NARA , RU and MWCC to explore the possibility of recruiting commercially viable fish species in the lagoon
- Determine cost, benefits and the sustainability of such activities on communities in the long run.

Strategy 5

Expansion of the mangrove communities around the lagoon and other suitable locations in the SAM area

Actions

- Launch a campaign on mangrove re-plantation in suitable locations
- Establish mangrove plant nursery and provide a variety of suitable mangrove species
- Obtain the technical and financial support from Department of Forests and other sources
- Conduct awareness programmes with the help of RDF and FD

Strategy 6

Introduce sustainable fishery resource management

Actions

- Formulate and implement appropriate fishery regulation to curtail destructive fishing methods
- Strengthen and expand lagoon fisheries co-operatives on a spatial basis
- Conduct education and awareness programmes on sustainable fisheries management in collaboration with NARA, RU and the GTZ Project

Strategy 7

Prepare and implement an eco-tourism plan / Mawella Lagoon integrating with blowhole development plan

Actions

- Establish institutional mechanisms plan (including MWCC, DS, CTB, PS and Provincial Council) to formulate eco-tourism plan
- The Plan should address the following areas :
 - Improvement of infrastructure facilities
 - waste minimization
 - conservation of habitats including floral and faunal communities
 - information dissemination
- Establish eco-tourism center at Phajjawa in close proximity to the Matara-Tangalle main road with the assistance of CTB, PS and RDF.

4.1.4 Objectives and policies regarding the public access

Issue : Lack of access, existence of obstructions and unavailability of lagoon reservation

The management objectives in relation to the access and buffer areas of the Mawella are to:

- Protect existing access to the lagoon and provide new access to enhance the fisheries and other lagoon uses
- Minimize user conflicts pertaining to public access to the lagoon
- Preserve and ensure quality of view corridors

To achieve the above objectives the following policies are proposed:

- Ensure public right of access to the lagoon without any hindrance
- Enhance public access in compliance with the development taking place in the SAM area
- Ensure the maintenance of visual access points to increase the quality of the lagoon environment
- Maintain buffer area / lagoon reservation to minimize damages from floods

Strategy 1

Ensure use of existing public access around the lagoon

Actions

- Establish the actual width of the access roads by demarcating legal boundaries and carry out improvements
- Remove existing impediments to allow free access to the lagoon
- Prepare and fix, appropriate sign boards highlighting the right of public access

Strategy 2

Enhance access opportunities considering the potential development in the vicinity of the lagoon

Actions

- Investigate and undertake land acquisition program to provide new access to the lagoon
- Investigate possibilities of acquiring new access from lagoon fronted land when permits are issue for building construction
- Impose a condition on requirement of allocating adequate access roads to the lagoon, when large extent of lagoon fronted land are partitioned

Strategy 3

Preserve and maintain the scenic quality of the existing view corridors

Actions

- Determine the most suitable locations to be maintained as view corridors
- Obtain community support /consensus to maintain such locations
- Provide alternative land for any other activities currently taking place in such location
- Encourage and give adequate guidance to the people to prepare building designs in harmony with the quality of the visual access point
- Prepare guidelines for development in, or adjacent to “view corridors”

Strategy 4

Maintain proper lagoon reservation

Actions

- Determine and demarcate appropriate area as lagoon reservation with the consensus of the communities
- Impose and implement lagoon reservations when issuing permits for building construction in the water fronted land of the lagoon by PS
- Carry out regular monitoring and enforce legal action against violators
- Educate the communities on the importance of maintaining lagoon reservation as means of flood protection

4.1.5 Objective and policies to promote economic sustainability

Issue : Declining economic status of communities that depend on coastal and lagoon resources

The declining economic conditions of the communities that depend on the coastal and lagoon resources will continue in Mawella and Kudawella SAM area unless some alternative economic activities capable of providing income and employment are developed. Thus the management objectives of the MWCC are to;

- Reduce unemployment to a minimum level in the SAMP area
- Improve the productivity of and the income from lagoon and coastal fishery resources
- Reduce income inequalities prevailed among fishing communities
- Increase self reliance in the community to reduce the number of families which depend on government welfare packages

The following Policies will be adopted to achieve the above objectives

- Introduce new ways and means to increase productivity and income from the lagoon and coastal resources
- Curtail the use of destructive fishing gear and methods
- Promote diversification of coastal and lagoon fishing industry
- Increase the level of education among the communities
- Discourage and reduce the expenditure incurred by the community on alcohol and drugs
- Encourage savings and investment within the SAM area

Strategy 1

Reduce the fishing effort while maintaining the coastal and lagoon fishery resources on a sustainable level

Actions

- Limit the number of fishing crafts and other gear that can be used for fishing in the lagoon
- Maintain the fleet of day boats used for near shore fishing at the existing level
- Increase number of multi-day boats used for offshore fishing activities
- Provide better anchorage and harbour facilities in close proximity to the SAM area

Strategy 2

Enforce fisheries regulations effectively to curtail the use of destructive fishing gear and methods

Actions

- Prohibit purse seining (“light course”) and the use of bottom set nets in Mawella Madal Paduwa
- Carry out an effective surveillance system with the help of coast guards
- Educate and make the people aware of the negative impacts of such destructive fishing practices

Strategy 3

Investigate and implement a lagoon and coastal fishery diversification programme

Actions:

- Identify and introduce the diversification of fishing industry by initiating small scale industries (maldivian fish production, dry fish production)
- Improve the quality of fish and other related products

Strategy 4

Ensure sufficient level of school attendance and develop education infrastructure

Actions:

- Ensure that all children of school going age attend schools
- Provide incentives and facilities for school children with the assistance of ED, DS and other Non governmental Organizations
- Develop and increase available facilities of the schools located within the SAM area
- Direct some portion of the income that could be gained from the blowhole entrance fee and from the proposed echo-tourism center
- Obtain assistance to develop village libraries

Strategy 5

Initiate and implement community programme to combat drug and alcohol

Actions

- Conduct carefully structured awareness programme on the negative social and economic impacts of drugs and alcohol
- Stimulate the participation of community/religious leaders in planning and implementing such programmes
- Conduct open dialogue on drugs and alcohol with youth groups
- Develop recreational and sport facilities with a view to wean away the youth from drugs and alcohol

Strategy 6

Promote savings habits among fishing communities, and encourage investment within the SAM area

Actions

- Initiate programme to increase personnel saving habit among the fishing communities through SANASA , Fisheries Cooperatives,WDF,SMF and other relevant banking institutions
- Provide technical and financial advice to start small scale business ventures within the SAM area
- Establish an information center attached to the village library to disseminate information on industrial investment, savings, health, fish technology and employment opportunities

4.2 Kudawella

The objectives, policies, strategies and actions for the management of issues identified in Mawella lagoon and related environs were set out in the previous section. Similarly, the objectives, policies, strategies and actions for management were described in the preceding section for Kudawella Blowhole and related environs. Some of the issues as well as actions for management are closely interrelated. Thus overall actions for management should consider as appropriate and the most efficient ways of minimizing prevailing issues in the total SAM area.

4.2.1 Objectives and policies to improve for Management economic, social, and cultural stability

Issue : Declining economic, social, and cultural stability of the Kudawella blowhole and its environs

The economic, social, environmental and cultural stability of the Kudawella Blowhole and its environs will continue to decline if a proper management programme is not implemented. The objectives of management are as follows;

- To increase the economic/environmental benefits for the residents of the area through development of Kudawella blowhole and its environs
- To prevent degradation of the environmental and scenic quality of the blowhole and improve the public safety
- To improve social and cultural stability of Kudawella blowhole and its environs by eradicating socially and culturally undesirable habits, drugs and alcohol
- To minimize conflicts between villagers and tourist who visit the blowhole

The following policies are adopted to achieve the objectives

- Promote and extend economic benefits that can be gained from blowhole and its environs among the residents of the area
- Encourage nature based planned tourism and recreational facilities
- Preserve cultural identity and stabilize social condition of Kudawella fishing communities
- Maintain and protect sound relationship between villagers and visitors

Strategy 1

Formulate and implement development plan for blowhole to increase economic gains

Actions

- Establish working committee representing CCD, DS, GSMB, PS, WSDB, CTB, UDA and SDA to formulate, design and implement necessary action plan
- Introduce and charge reasonable amount from visitors as a blowhole entrance fee
- Provide a view deck to curtail the further degradation of the top soil/rock layer in the vicinity of the blowhole and improve access roads compatible with the natural state of the environment
- Provide printed materials containing information on the importance of the blowhole, public safety, conservation of blowhole and the SAM process at Mawella - Kudawella
- Introduce security /life saving system to ensure public safety and minimize risk of accidents
- Upgrade and establish proper parking facilities, information center, latrines and access road in compliance with the Blowhole Development Plan
- Upgrade and diversify small scale commercial establishment with the assistance of SDA, IDB, SANASA

Strategy 2

Introduce and Encourage private–public partnership for the development of nature based tourism/other industries.

Actions

- Prepare detail site specific land use/zoning plan for SAM area consistent with the District Zoning Plan prepared by HICZMP
- Formulate proper guidelines for nature based tourism development in Mawella and Kudawella area
- Integrate activities proposed under eco-tourism development at Mawella with blowhole development by diverting visitors from the blowhole and *vice versa*

- Obtain assistance from the SDA,CTB,HDCC and relevant financial institutions to initiate self employment projects related to nature based tourism
- Disseminate information on the importance as well as opportunities available for nature -based tourism
- Provide proper training on skill development, and financial/business management for unemployed youth

Strategy 3

Conduct mediation and negotiation process through education and awareness to minimize user conflicts between villagers and visitors

Action

- Train groups of youth to act as catalysts/mediators to keep good relationship between villagers and the visitors
- Prepare information leaflet to be distributed among visitors on the importance of proper behaviour at the site.
- Provide police/security post especially during the peak season

Strategy 4

Ensure cultural and promote social stability by preventing drug abuses and addiction to alcohol within Kudawella and environs

Action

Increase the rate of school attendance by providing incentives and encouraging parents
 Encourage youth to organize and participate in religious activities
 Educate students and youth on social and health impacts of alcohol and drug use
 Conduct seminars and workshops to highlight the adverse impacts of such habits
 Mobilize community to extend necessary assistance and support to the police to control the use of drugs and alcohol.

4.2.2 Objectives and policies to increase awareness, education on enforcement of regulations

Issue: Lack of awareness, education on enforcement of regulations

Inadequate public awareness and education, as well as enforcement of regulations pose difficulties in coastal resource management within the area of the blowhole and its immediate environs. Thus the management objectives are:

- To enhance community awareness and education on coastal resource management in general, and blowhole conservation in particular
- To increase the effectiveness of regulating development activities which lead to negative impacts on social and environmental status of Kudawella coastal area
- To maintain sustainable resource utilization, preservation of scenic resources and prevent social conflicts in Kudawella coastal area
- To increase effective public participation in coastal resource management

To fulfill the above objectives it is proposed to implement the following policies consistent with the National Coastal Zone Management Plan of 1997

- Assure effective public awareness and education in all phases of SAM planning and implementation process
- Stimulate public awareness and education in coastal resource management and preservation of the blowhole
- Ensure proper enforcement of legal action against violations

Strategy 1

Design and implement proper action plan for public awareness and education

Actions

- Carry out a needs assessment and formulate an action program for educating target groups
- Produce printed materials for information dissemination on guidelines, rules and regulations that should be followed on development activities within the SAMP area

Strategy 2

Carry out effective enforcement and monitoring procedures for regulating development activities

Actions

- Regulate development activities which may lead to changing the scenic quality of the blowhole within the 200m periphery under the provisions of the CC Act
- Implement prompt legal action against violations and unauthorized construction within the coastal zone
- Vest ownership of the land on which blowhole is located as well as the adjacent land (at least 200 meter peripheral area) with the DS of Tangalle
- Remove structures located within the 200 m periphery by acquiring land after negotiating with the landowners.

4.2.3 Objectives and policies for conservation of landscape/scenic qualities

Issue: Degradation of environmental and scenic quality of the blowhole and the environs

The environmental and scenic quality of the blowhole and its immediate environs will continue to be degraded if the problems affecting the environmental stability are not addressed urgently. To curtail this situation all stakeholders have agreed upon the following objectives:

- Preserve the environmental and scenic quality of the blowhole and its immediate environs
- Stop undesirable development near the blowhole and the surrounding area
- Encourage properly planned and authorized development and the use of conservation measures

The following policies are adopted to achieve the desired objectives:

- Restrict access to the fragile area of the blowhole
- Prevent undesirable development closer to the blowhole and peripheral area
- Maintain future development in a way that compatible with the environmental character of the proposed blowhole development plan

Strategy 1

Improve environmental and scenic quality of blowhole, the peripheral area and the entrance point at Kudawella junction

Actions

- Develop an action plan on the wetland area located at the entrance point near Kudawella junction to maintain the scenic and environmental quality
- Replant mangrove vegetation and suitable plants to enhance the scenic quality
- Resolve land ownership issues with the assistance of the DS Tangalle
- Design and implement a landscaping plan consistent with the natural setting and supplemented with vegetation cover by the sides of the access roads and around the blowhole

Strategy2

Introduce and implement design guidelines for constructions in the vicinity of blowhole

Actions

- Develop design guidelines for new construction to be located outside the 200 m periphery of the blowhole
- Lay down the requirement that design guidelines be applied to ensure that development is integrated into the natural environment
- Establish and maintain proper waste collection system with the assistance of the Pradeshiya Sabha
- Minimize/prohibit use of plastic/polythene and other non bio-degradable material in the vicinity of the blowhole

Strategy 3

Launch an environmental and education programme to maintain the scenic quality of the blowhole and its immediate environment

- Design and implement a public awareness and education campaign for both Mawella and Kudawella only after carrying out a proper needs assessment
- Educate visitors and villagers on the importance of maintaining environmental and scenic quality of the blowhole
- Establish an information center adjacent to blowhole under the proposed blowhole development plan

4.2.4. Objectives and policies for management and control of coastal pollution

Coastal environmental pollution the rapid by increase in Kudawella coastal area, mainly due to heavy solid waste discharges from households, visitors to the blowhole, commercial establishments and disposal of waste oil and bilge water from fishing vessels. This situation will deteriorate further in the future causing environmental, social and economic hazards, if proper mitigatory measures are not taken. Therefore the KWCC and the other stakeholders have agreed on the following management objectives.

- Minimize dumping of solid waste and waste oil into the coastal environment
- Improve quality of the beaches and the coastal waters
- Minimize risk of health hazards and other negative impacts of coastal pollution

To achieve the above objectives, the following management policies are proposed

- Maintain environmental quality of the coastal resources by introducing a household refuse, fish and waste oil collection system
- **Ensure** necessary financial assistance to sustain waste collection systems

- Encourage production and conversion of waste into other economically valuable materials
- Prohibit/minimize use of plastics/polythene and other non-biodegradable materials in the vicinity of blowhole

Strategy 1

Establish proper collection system for solid waste and waste oil management

Actions

- Set-up regular waste collection system with the assistance of PS, KWCC as part of the Blowhole development plan
- Provide appropriate equipment to collect solid waste from dwellings/commercial establishment and the surroundings of the blowhole
- Establish proper waste oil reception facilities at Kudawella Fisheries Harbour premises as well as existing anchorage

Strategy 2

Ensure continuous financial provisions for sustainable waste management system

Actions

- Encourage and assist communities to produce compost fertilizer from domestic solid waste
- Provide necessary assistance to convert waste oil into more commercially valuable product
- Provide necessary technical assistance and training on the above aspects
- Allocate part of the revenue that will be collected by way of blowhole entrance fee for waste management

Strategy 3

Curtail use of non-biodegradable materials especially plastic and polythene in the vicinity of the blowhole

Actions

- Encourage use of biodegradable materials for wrapping and other commercial or recreational purposes
- Educate visitors and the community on the importance of avoiding the use of plastics/polythene
- Educate fisherfolk on the importance of proper discharge of waste oil to maintain environmental quality of the area

4.2.5 Objectives and policies for management infrastructure development

Issue: Inadequate infrastructure facilities at Mawella and Kudawella

The population of the SAM area will continue to increase in line with the expected rates population growth. In addition the expansion of fisheries and tourism related development the infrastructure facilities and amenities in the area will be heavily pressured. Thus drinking water, road transport network, communication facilities unless improved updated and expanded will remain a critical constraint on the socio-economic development and environmental health of the area. Hence, the main management objectives in relation to infrastructure are:

- To increase quality and quantity of infrastructure facilities, to cater to the present and future demand
- To enhance social, economic and environmental conditions of the people within the SAM area

To achieve the desired objectives, the following policies are proposed

- Ensure sufficient volume of drinking water supply within the SAM area
- Promote improvement in communication facilities within the SAM area
- Upgrade and maintain the condition of the road network

Strategy 1

Establish and encourage introduction of new water supply scheme with construction of a storage tank.

Actions

Prepare estimates on demand for water in considering present and future demand based on current and anticipated development within the SAM area

Determine the cost and benefits of expansion of portable water supply scheme within the SAM Plan area

Determine supply of water according to priority needs and obtain political support/ acceptance for planning and implementation of a new project for water supply

Strategy 2

Minimize waste and unnecessary uses of current drinking water supplies by adopting water conservation measures

Actions

Encourage and educate people on water conservation measures

Restrict pipe-borne water only for uses such as cooking and drinking and encourage use of water from other sources such as wells for other uses.

Strategy 3

Initiate programme to upgrade and maintain the condition of the road network.

Actions:

Widening of main access roads within the SAM Plan area

Establish one way system for the road leading to Kudawella blowhole and fishery harbor.

Resurface exiting road network

5. LEGAL AND INSTITUTIONAL MECHANISM AND IMPLEMENTATION SCHEDULES

5.1 Implications and Legal framework for management

The availability of a legal basis and an efficient institutional mechanism are prime pre-requisites for successful implementation of a Special Area Management Plan (SAMP). The past efforts which have been undertaken by the Coast Conservation Department in adopting and implementing SAM Plans (at Hikkaduwa and Rekawa) demonstrated some notable constraints. One important constraint was the absence of a legal basis to formulate and implement SAMP through collaborative effort. Although the Coastal Zone Management Plan of 1990 and the Coastal 2000. (A Strategy for Coastal Resource Management of 1992) stressed the importance of developing and implementing site specific plans for coastal resource management, there were no adequate legal basis to carry out such activities. The Coast Conservation Act No.57 of 1981 and its subsequent amendment or the other legislative enactment that relates to coastal resource management also do not provide direct legal guidance for SAMP. The limited extent of the geographic area, which comes under the definition of the “coastal zone” also posed difficulties in considering larger geographic boundaries both in terms of land and water area under the Special Area Management process.

Thus the Special Area Management Plans which were formulated for Rekawa Lagoon (1996) and Hikkaduwa (1996) by Coast Conservation Department heavily depended on informal administrative and institutional arrangements and the general consensus among interested and effected parties in formulating, adopting and implementing management actions. As a result of this situation, the management outcome of both plans shows several similar drawbacks.

Assuming that there are no major changes to the present legal or institutional set-up available for implementing SAM strategy, two major types of constraints described below could be envisaged;

5.1.1 Implementation constraints

- Local, provincial or national level constraints in plan adoption or approval due to unavailability of proper legal provisions
- Lack of incentives and authority for long term commitments by the involved government /non governmental agencies at a local level
- Absence of proper procedures to change, modify, terminate or introduce new management policies as required over time
- Lack of authority to accommodate management actions proposed under the SAMP in their annual work plans/programs
- Lack of financial and manpower resources

5.1.2 Regulatory constraints

- Inability to hand-over responsibility and power of implementing regulatory actions of central agencies to the communities or non-governmental organizations.
- Limits on the possibility on the efficacy of devolving coastal resource management functions to the local level agencies
- Limits on implementing regulatory actions beyond the coastal zone using the provisions under coast conservation legislation

In view of the above constraints, it is important to pay careful attention to the need for proper legal and institutional arrangements with regard to SAMP. Hence, considering the practical aspects of implementation, it is necessary to use the available legal and institutional facilities as much as possible till whatever legal and institutional arrangements are introduced under the proposed Coast Conservation and Coastal Resource Management Act⁶.

Unlike the previous SAM efforts, the Special Area Management Plan for Mawella Lagoon, Kudawella Blowhole and related environs have direct link with the National CZM Plan of 1997 which, has been approved by the Ministers of Cabinet (See Page 100-101 of Revised CZM Plan 1997). According to Revised CZM Plan of 1997, both Mawella Lagoon and Kudawella Blowhole have been identified as high priority sites for adopting a Special Area Management approach for better resource management. It is also important to note that the proposed Coast Conservation and Coastal Resource Management Act (1999) also provide direct legal provisions for the adoption and implementation of SAMPs. Hence, any legal provisions which may emanate from the new Coast Conservation and Coastal Resource Management Act will create a better legal environment for implementation of SAM plans in an effective manner.

Apart from the RCZM Plan (1997) and the proposed Coast Conservation and Coastal Resource Management Act, there are a number of other options for achieving the desired objectives of SAM. From the discussions had with the officials of the Department of Fisheries, Ceylon Tourist Board, Coast Conservation Department and the Urban Development Authority it has been revealed that the necessary provisions for establishing a legal and institutional framework for coastal resource management could be provided through existing legal statutes. However to maintain the interest and confidence among stakeholders, the SAMP implementation process has to be phased as described below assuming that the new Coast Conservation and Coastal Resource Management Act will come into force within a short period.

Phase 1:

- Finalization of the SAM Plan by the stakeholders
- Establishment of Coordinating Committee and community coordinating committees (what about what is already there)
- Obtain local provincial and central level agency agreement
- Carry out priority management strategies indicated under proposed management policies relevant to fisheries, bio-diversity conservation, lagoon access and pollution control
- Carry out management strategies to control development activities within the coastal zone in accordance with the coast conservation act and other peripheral development in accordance with the UDA Act
- Carry out land acquisition for providing access adopting existing legal procedures vested with Divisional Secretary

Phase 2:

- Declare Mawella- Kudawella sites as a Special Management Area under section 58 of New Coast Conservation and Coastal Resource Management Act by Gazette notification
- Establish SAM Coordinating committee under the provisions of section 60 (ii) of the Coast Conservation and Coastal Resource Management Act
- Review and evaluate effectiveness of activities carried out under phase 1 of the implementation process

⁶ Coast Conservation and Coastal Resource Management Act is being reviewed by Legal Draftsmen Office and expected to be introduce in later part of year 2000

- Where necessary, modify management procedures in compliance with the New Coast Conservation and Coastal Resource Management Act
- Continue the implementation process based on new legal provisions
- Setup sustainable financial mechanisms for implementation using local/provincial/central government allocations
- Setup monitoring committee to get feedback for modify, terminate or introduce management policies and actions
- Explore possibilities to obtain necessary funds from donor agencies to implement major actions of the SAM Plan

5.2 Proposed Institutional Framework

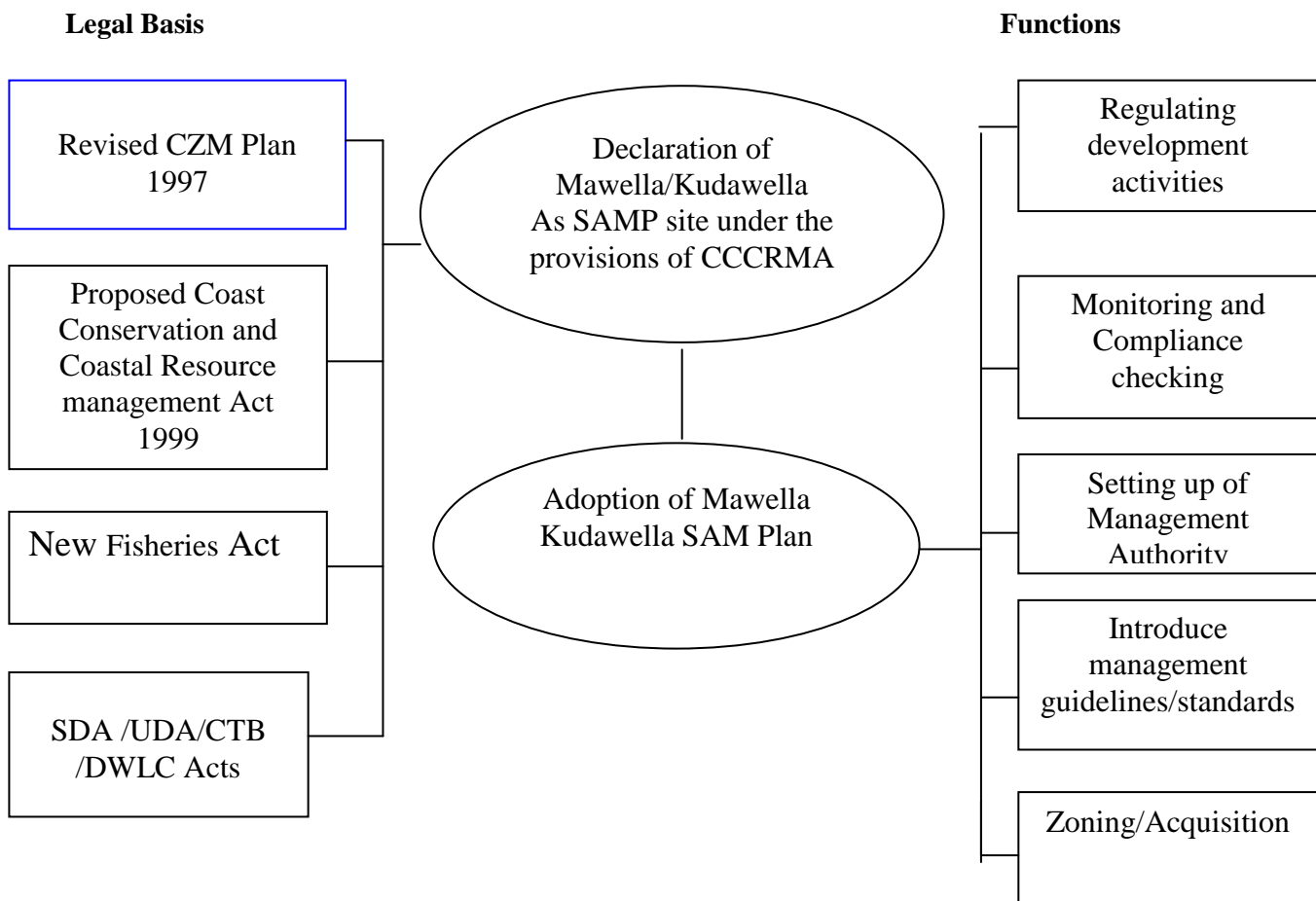
Special Area Management Programs in Rekawa and Hikkaduwa introduced new form of institutional framework for managing coastal resource in the country in which the local community groups, government agencies and other stakeholders took an active part in planning, decision making and implementation. In this process, all relevant parties participated and agreed upon a fixed set of terms of reference to implement management policies and actions for the sustainable utilization of coastal resources. In the absence of structured or legally setup formal institutional mechanisms, the responsible groups were able to achieve and produce positive results in accordance with the desired objectives (Figure 5.1)

In considering the strengths and weaknesses of the institutional framework adopted in the previous SAM exercises in the country, it is proposed to adopt a modified type of institutional mechanism for the overall implementation of the Mawella - Kudawella SAM Plan.

In accordance with the desired objectives of the proposed SAMP and need for maintaining consistency with the National CZM objectives and policies, the new institutional framework has been proposed on the basis of following long -term and short-term requirements.

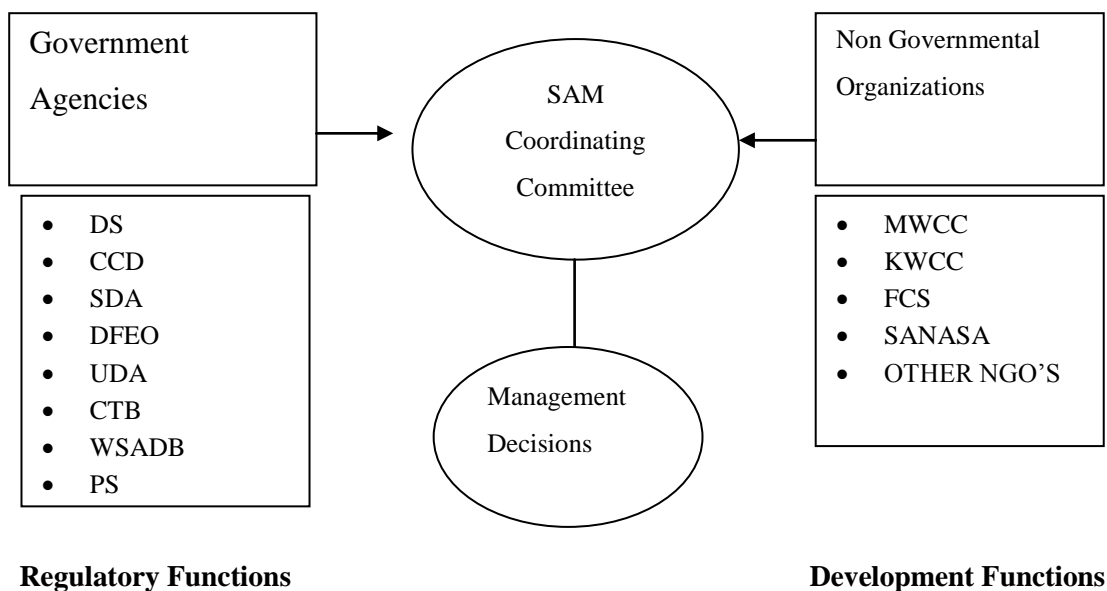
- Sustainability of the programme
- Sharing management responsibility between government organizations
- Achievement of results in a positive and cost effective manner in the urgent and priority management areas
- Equitable distribution of benefits
- Quick response to failures
- Maintaining economic development while conserving coastal resource

FIGURE 11. PROPOSED LEGAL FRAMEWORK



To meet the above requirements and to comply with the prevailing legal provisions, the institutional framework for plan implementation is proposed as described below (Figure 12 & 13).

FIGURE 12 INSTITUTIONAL STRUCTURE: PHASE 1



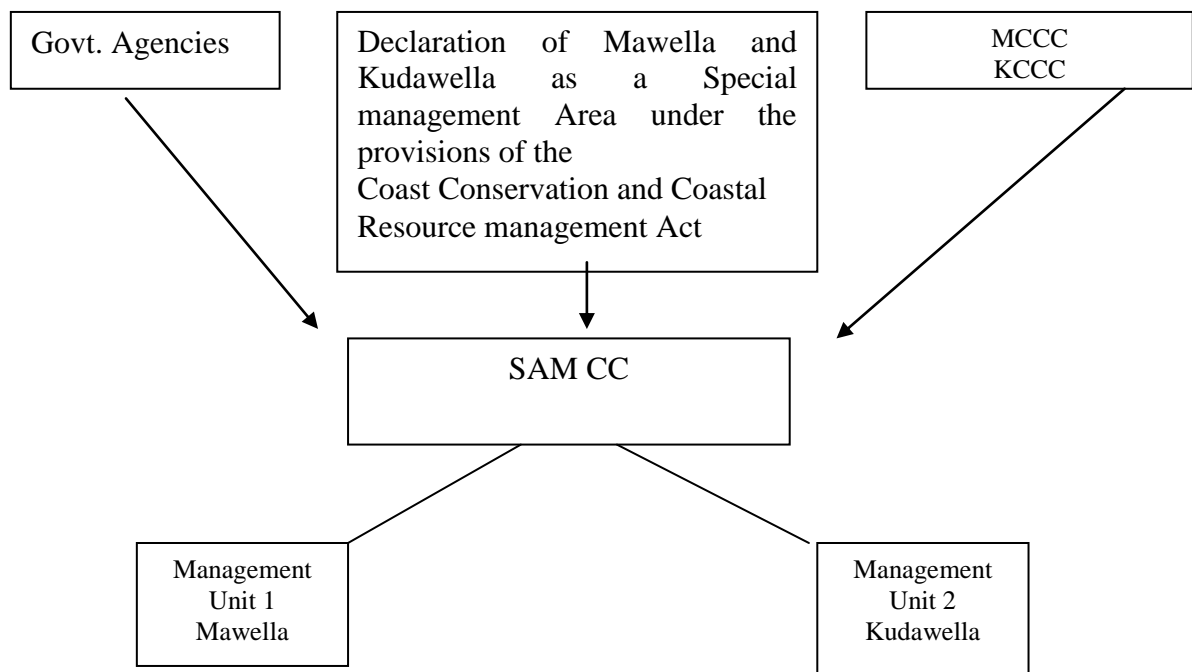
The task of implementing proposed management policies and actions in the SAM plan is a major challenge confronted by the stakeholders. To achieve the desired objectives of the plan, it is proposed to launch implementation activities in two phases. In the first phase, a Coordinating Committee (SAM CC) which comprised both government agencies and non-governmental organizations should be established under the chairmanship of Divisional Secretary of Tangalle Division⁷. The formulation of the SAM CC could be carried out on lines similar to the informal institutional arrangement used in the case of Rekawa. The SAM CC could play the role of the decision maker pertaining to SAMP implementation.

Thereafter, the SAMP plan could be finalized through community agreement and the consensus of local provincial and central level agencies. This process will enable to oversee the possibility of the inclusion of management actions, which were identified in the SAM Plan under the respective provincial and central agency work plans. Beside plan implementation, the responsibility for monitoring of management actions also could be vested with the SAM CC

Although there were no legal provisions for involving the community in regulatory functions, it could be carried out by the SAM CC since there would be adequate representation from the government agencies.

The phase 2 implementation activities could proceed with the declaration of Mawella and Kudawella coastal segment as a Special Management Area under the provisions of section 58 of the Coast Conservation and Coastal Resource Management Act. Once the Special Management Area has been gazetted, the SAM CC could be reformulated under the provisions provided through section 60 of the said Act. This will provide it with the legal authority to implement necessary management actions spelt out in the SAM Plan.

FIGURE 14. INSTITUTIONAL STRUCTURE: PHASE 2



⁷ SAMP CC has been formulated early stages of the planning process

In order to strengthen and improve the efficiency of institutional setup in planning, implementation and monitoring processes, it is proposed to obtain assistance from the local level government and non governmental institutions as indicated in the Tables 5.1 & 5.2).

5.3 Implementation schedule and priorities for actions

The implementation schedule and priorities for actions are summarized in the following table. Priorities for actions are indicated along with agencies that are responsible for implementation and relevant time sequence. The priority levels have been determined in a subjective manner in terms of the magnitude of the problem, possibility of obtaining necessary financial resources and the implementation capacities of the existing institutions. However it is important to note that implementation could be initiated only after the preparation of individual project proposals for components identified under the implementation schedule. In this regard careful attention have to be placed on proper assessment of environmental impacts, cost – benefits and community agreement on ways and means of implementation (Annex 2 Implementation schedule)

TABLE 11. LOCAL LEVEL GOVERNMENT INSTITUTIONS/AGENCIES

| INSTITUTION | TYPE | ROLE/SERVICES |
|--------------------------------------|--------------|--|
| Divisional Secretary | Government | Focal point, coordination |
| District Fisheries Extension officer | Government | Fisheries extension, subsidies, monitoring, coordination |
| Planning Officer UDA | S/government | Planning/ regulating |
| Pradesiya sabawa | L/government | Regulating /implementation |
| Environmental officer | Government | Regulating/monitoring |
| Public Health Inspector | Government | Health care/enforcement |
| Manager-NWSDB | S/Government | Planning/implementation |
| OIC-Sri Lanka Poloce | Government | Enforcement |
| Samurdhi Manager | Government | Social welfare/development |
| Grama Niladhari | Government | Enforcement/Coordination Monitoring |

TABLE 12. NON-GOVERNMENTAL ORGANISATIONS (CBOS & NGOS)

| INSTITUTION | NO. | ROLE |
|-------------------------------------|-----|-----------------------------|
| Lagoon Fisheries Society | 01 | Credit/welfare |
| Small scale women fisheries society | 01 | Credit |
| SANASA | | Credit |
| Janashakthi Bank | | Savings/credit/insurance |
| Samurdhi Organization | | Credit facilities/subsidies |
| Blowhole protection society | 01 | Environmental conservation |
| Fisheries cooperative Society | | Credit/fishing gear/ |
| Sarvodaya | | Rural development |
| Death donation Society | | Social welfare |

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ANNEX 1: VILLAGES OF SAMP AREA

| NAME OF THE GND | NAME OF VILLAGE |
|---------------------------|--|
| Moraketiara (E) | Aluthwattagoda Kotuattawagoda |
| Moraketiara W) | |
| Mawella (N) | Mawella |
| Mawella (S) | Kandegoda Mawellagoda |
| Kudawella (S) | Pansalagoda Nikaketiyaoda |
| Kudawella (C) | Bokotuwagoda Duhengoda Medagoda Kaduruwinnagoda |
| Kudawella (N) | Mulanagoda Medagoda Duhengoda |
| Kudawella (E) | Kandegoda Kaduruvinnegda Welladdaragoda |
| Ihalagoda | Ihalagoda Pahalagoda |
| Pahajjawa | Pahajjawa Pollattara |
| Nakulugamuwa (S) | Wellawattagoda |
| Mahawela | Mahawela bazaar Mahawelagoda |
| TOTAL NO OF GND 12 | TOTAL NO. OF VILLAGES 28 |

ANNEX 2. IMPLEMENTATION SCHEDULE

MAWELLA

| | | |
|---|--|-----------------|
| Issue 1: Pollution of lagoon water and change of physical conditions of the lagoon | Agencies to be involved in implementing strategy | Priority Level |
| Strategy 1: Establish permanent connection between lagoon and the sea | CCD, IRD, DS, MWCC, DFEO, PS, CRMP | High priority |
| Management Actions: <ul style="list-style-type: none"> • Rehabilitation of Mawella canal. • Proper maintenance of existing drains and preventing silting of the canal • Engineering investigations for construction of an outfall structures at the canal mouth Conduct community awareness and education campaign for proper maintenance of the canal • Create working committee consisting relevant stakeholders to ensure the proper management of the canal | | |
| Strategy 2: Dredging of silted areas of the lagoon | MWCC, PS, DS, NARA, DFAR, RU | Medium priority |
| Management Actions: <ul style="list-style-type: none"> • Demarcate and finalized areas and scale of dredging necessary to improve the condition of the lagoon • Prepare Environmental Impact Statement to determine positive and negative effects of dredging • Establish monitoring plan that could be implement with community participation | | |
| Strategy 3: Prohibit sewage discharges to the lagoon/canal and provide technical advice/assistance to maintain existing septic systems. | MCC, DS, HD, UNICEF, CRMP, PS | High priority |
| Management Actions: <ul style="list-style-type: none"> • Identify exact point sources of such discharges and informed properly regarding prohibition • Provide financial/technical assistance to construct new latrines for dwellings located close proximity to the lagoon and/or canal banks. • Co-ordinate and obtain support from government and non-government agencies to raise funds and obtain technical advice • Conduct public awareness and education campaign to create awareness among communities to maintain quality of the lagoon waters | | |
| Strategy 4 Introduce lagoon/canal water monitoring system. | NARA, MCC, RU | Medium priority |
| Management Actions: <ol style="list-style-type: none"> 1. Formulate lagoon water quality monitoring system with the help of NARA Regional Research Center at Rekawa and University of Ruhuna 2. Mobilize school children to carry out monitoring activities 3. Establish sustainable financing mechanism for long term monitoring activities | | |

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| Issue 2: Degradation of faunal and floral resources and decline in the productivity of the lagoon | DS, SD, DFAR, MCC, CCD | |
| Strategy 1 : Establishment and maintenance of lagoon boundaries | | |
| Management Actions: <ul style="list-style-type: none"> • Conduct survey and prepare plans indicating legal boundaries • Demarcate lagoon boundary with suitable signs (eg. Negombo Lagoon boundary demarcation) • Prevent further encroachment by enforcing regulations • Conduct awareness programmes highlighting the necessity of maintaining lagoon water area | | |
| Strategy 2: Ensure proper functioning of the canal to maintain salinity levels and curtail solid and/or other form of waste discharges into the lagoon waters or into the canal | MCC, CCD, DS, DFEO | High priority |
| Management Actions: <ul style="list-style-type: none"> • MCC should take necessary action to keep the canal mouth open by removing the sand bar at the canal mouth manually • Proper maintenance of fourteen inlets located around the lagoon • Prohibit the use of plastic and polyethene items in all activities proposed under “eco-tourism development” • Prohibit the use of mechanized fishing/recreational vessels in the lagoon | | |
| Strategy 3: Preparation and implementation of an action plan for managing surface water runoff and natural siltation due to aquatic weeds | NARA, ID, MCC, DFAR | Medium priority |
| Management Actions: <ul style="list-style-type: none"> • Construct silt traps for the fourteen water inlets located around the lagoon • Investigate status of soil erosion due to agricultural practices on hill slopes adjacent to the lagoon and provide technical assistance to prevent soil erosion • Remove aquatic weeds such as <i>Najas marina</i> (Katupenda) which contributes to natural siltation | | |
| Strategy 4: Initiate a programme to recruit commercially and environmentally viable fish and crustaceans into the lagoon | NARA, RU, MCC, FCS | Low priority |
| Management Actions <ul style="list-style-type: none"> • Conduct investigation to determine process of recruitment of suitable fish, shrimp larvae and crabs with the assistance of NARA and RU • Allocate suitable area from the lagoon and carry out a pilot project with NARA, RU and MWCC • Determine cost, benefits and the sustainability of such activities on communities in the long-run. | | |
| Strategy 5: Expansion of the mangrove communities around the lagoon and other suitable locations in the SAM area | MWCC, CCD, DFO, DFAR | Medium priority |

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| <p>Management Actions</p> <ul style="list-style-type: none"> • Launch a campaign on mangrove re-plantation in suitable locations • Establish mangrove plant nursery and provide a variety of suitable mangrove species • Obtain the technical and financial support from Department of Forests and other sources • Conduct awareness programmes with the help of RDF and FD | | |
| <p>Strategy 6: Introduce sustainable fishery resource management</p> | DFAR, DFEO, FCS, MCC | High priority |
| <p>Management Actions:</p> <ul style="list-style-type: none"> • Formulate and implement appropriate fishery regulation to curtail destructive fishing methods • Strengthen and expand lagoon fisheries cooperatives on a spatial basis • Conduct education and awareness programmes on sustainable fisheries management in collaboration with NARA, RU and the GTZ Project | | |
| <p>Strategy 7: Prepare and implement an eco-tourism plan for Mawella Lagoon integrating with blowhole development plan</p> | MWCC, SDA, CTB, KWCC | Medium priority |
| <p>Management Actions</p> <ul style="list-style-type: none"> • Establish institutional mechanism to formulate eco-tourism plan consisting with the assistance of MWCC, DS, CTB, PS and Provincial Council • The Plan should address the following areas : • Improvement of infrastructure facilities • Determine procedures to be adopted on limiting visitors • Determine ways and means to attract local and foreign visitors to the proposed eco-tourism center to be setup at Mawella • waste minimization • conservation of habitats including floral and faunal communities • information dissemination • Establish eco-tourism center at Phajjawa in close proximity to the Matara-Tangalle main road with the assistance of CTB, PS and RDF | | |
| <p>Issue 3: Lack of access, existence of obstructions and unavailability of lagoon reservation</p> | DS, PS, MWCC, GN, SDA | High priority |
| <p>Strategy 1: Ensure use of existing public access around the lagoon</p> | | |
| <p>Management Actions:</p> <ul style="list-style-type: none"> • Establish existing access points by demarcating boundaries • Remove existing impediments to allow free access to the lagoon • Prepare and fix, appropriate sign boards highlighting the right of public access • Develop and improve existing public access | | |
| <p>Strategy 2: Enhance access opportunities considering the potential development in the vicinity of the lagoon</p> | DS, PS, MWCC, GS, SDA | Low priority |

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| <p>Management Actions:</p> <ul style="list-style-type: none"> • Investigate and undertake land acquisition program to provide new access to the lagoon • Investigate possibilities of acquiring new access from lagoon fronted land when permits are issuing for building construction • Impose a condition on requirement of allocating adequate land as access roads, when large extent of lagoon fronted land are subdividing | | |
| <p>Strategy 3: Preserve and maintain the scenic quality of the existing view corridors</p> | UDA, CCD, MWCC, PS | Low priority |
| <p>Management Actions:</p> <ul style="list-style-type: none"> • Determine the most suitable locations to be maintained as view corridors • Obtain community support /consensus to maintain such locations • Provide alternative land for any other activities currently taking place in such location • Encourage and give adequate guidance to the people to prepare building designs in harmony with the quality of the visual access point • Prepare guidelines for development in, or adjacent to “view corridors” | | |
| <p>Strategy 4: Maintain proper lagoon reservation</p> | DS, PS, MWCC, GN, SDA | High priority |
| <p>Management Actions:</p> <ul style="list-style-type: none"> • Determine and demarcate appropriate area as lagoon reservation with the consensus of the communities • Impose and implement lagoon reservations when issuing permits for building construction in the water fronted land of the lagoon by PS • Carry out regular monitoring and enforce legal action against violators • Educate the communities on the importance of maintaining lagoon reservation as means of flood protection | | |
| <p>Issue 4: Declining economic status of communities that depend on coastal and lagoon resources</p> | | |
| <p>Strategy 1: Reduce the fishing effort while maintaining the coastal and lagoon fishery resources on a sustainable level</p> | DFAR, NARA, MWCC, KWCC | Medium priority |
| <p>Management Actions</p> <ul style="list-style-type: none"> • Limit on number of fishing crafts and other gear that can be used for fishing in the lagoon • Maintain the fleet of day boats used for near shore fishing at the existing level • Increase number of multi-day boats used for offshore fishing activities • Provide better anchorage and harbour facilities in close proximity to the SAMP area | | |
| <p>Strategy 2: Enforce fisheries regulations effectively to curtail the use of destructive fishing gear and methods</p> | MWCC, KWCC, FCS, MFARD | Medium priority |

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| <p>Management Actions:</p> <ul style="list-style-type: none"> • Prohibit purse seining (“light course”) and the use of bottom set nets in Mawella Madal Paduwa • Carry out an effective surveillance system with the help of coast guards • Educate and make the people aware of the negative impacts of such destructive fishing practices | | |
| <p>Strategy 3: Investigate and implement a lagoon and coastal fishery diversification programme</p> | MCC, KCC, FCS, MFARD, SDA, GTZ, NARA, CRMP | Medium priority |
| <p>Management Actions:</p> <ul style="list-style-type: none"> • Identify and introduce the diversification of fishing industry by initiating small scale industries (maldive fish production, dry fish production) • Improve the quality of fish and other related products | | |
| <p>Strategy 4: Ensure sufficient level of school attendance and develop education infrastructure</p> | MWCC, KWCC, ED, DS, PC | Medium priority |
| <p>Management Actions:</p> <ul style="list-style-type: none"> • Ensure that all children of school going age attend schools • Provide incentives and facilities for school children with the assistance of ED, DS and other Non governmental Organizations • Develop and increase available facilities of the schools located within the SAM area • Direct some portion of the income that could be gained from the blowhole entrance fee and from the proposed eco-tourism center • Obtain assistance to develop village libraries | | |
| <p>Strategy 5: Initiate and implement community programme to combat drug and alcohol</p> | MWCC, TEM KWCC, ED, PS, PL, | High priority |
| <p>Management Actions:</p> <ul style="list-style-type: none"> • Conduct carefully structured awareness programme on the negative social and economic impacts of drugs and alcohol • Stimulate the participation of community/religious leaders in planning and implementing such programmes • Conduct open dialogue on drugs and alcohol with youth groups • Develop recreational and sport facilities with a view to wean away the youth from drugs and alcohol | | |
| <p>Strategy 6: Promote savings habits among fishing communities, and encourage investment within the SAM area</p> | MWCC, KWCC, PS, SB, FCS, SNASA | Medium priority |

| | | |
|---|--|--|
| <p>Management Actions</p> <ul style="list-style-type: none"> • Initiate programme to increase personnel saving habit among the fishing communities through SANASA , Fisheries Cooperatives, WDF, SMF and other relevant banking institutions • Provide technical and financial advice to start new small scale ventures within the SAM area • Establish a center attached to the village library to disseminate information on industrial investment, savings, health, fish technology and employment opportunities | | |
|---|--|--|

KUDAWELLA

| | | |
|--|---|------------------------|
| <p>Issue 1: Declining economic, social, and cultural stability of the Kudawella blowhole and its environs</p> | | |
| <p>Strategy 1: Formulate and implement development plan for blowhole to increase economic gains</p> | <p>KWCC, PS, CCD, DS, CTB, GSMB, UDA,</p> | <p>High priority</p> |
| <p>Management Actions:</p> <ul style="list-style-type: none"> • Establish working committee representing CCD, DS, GSMB, PS, WSDB, CTB, UDA and SDA to formulate, design and implement necessary action plan • Introduce and charge reasonable amount from visitors as a blowhole entrance fee • Provide a view deck to curtail the further degradation of the top soil/rock layer in the vicinity of the blowhole and improve access roads compatible with the natural state of the environment • Provide printed materials containing information on the importance of the blowhole, public safety, conservation of blowhole and the SAMP process at Mawella –Kudawella • Introduce security /life saving system to ensure public safety and minimize risk of accidents • Upgrade and establish proper parking facilities, information center, latrines and access road in compliance with the Blowhole Development Plan • Upgrade and diversify small scale commercial establishment with the assistance of SDA, IDB,SANASA | | |
| <p>Strategy 2: Introduce and Encourage private–public partnership for the development of nature based tourism/other industries.</p> | <p>KWCC, MWCC, PS, CTB, UDA</p> | <p>Medium priority</p> |

| | | |
|--|------------------------|-----------------|
| <p>Management Actions:</p> <ul style="list-style-type: none"> • Prepare detail site specific land use/zoning plan for SAM area consistent with the District Zoning Plan prepared by HICZMP • Formulate proper guidelines for nature based tourism development in Mawella and Kudawella area • Integrate activities proposed under eco-tourism development at Mawella with blowhole development by diverting visitors from the blowhole • Obtain assistance from the SDA,CTB,HDCC and relevant financial institutions to initiate self employment projects related to nature based tourism • Disseminate information on the importance as well as opportunities available for nature –based tourism • Provide proper training on skill development, and financial/business management for unemployed youth | | |
| <p>Strategy 3: Conduct mediation and negotiation process through education and awareness to minimize user conflicts between villagers and visitors</p> | KWCC, PS, POL, DS | Low priority |
| <p>Management Action</p> <ul style="list-style-type: none"> • Train groups of youth to act as catalysts/mediators to keep good relationship between villagers and the visitors • Prepare information leaflet on importance of proper behaviour in this location, to distribute among visitors with a view to promote good relationship • Provide police/security post especially during the peak season | | |
| <p>Strategy 4: Ensure cultural identity and promote social stability by preventing drug abuses and addiction to alcohol within Kudawella and environs</p> | KWCC, MWCC, PS, TEM | Medium priority |
| <p>Management Action</p> <ul style="list-style-type: none"> • Increase the rate of school attendance by providing necessary assistance and encouraging parents • Encourage youth to organize and participate in religious activities • Educate students and youth on social and health impacts of alcohol and drug use • Conduct seminars and workshops to highlight the adverse impacts of such habits • Extend necessary assistance and support to the police to control the use of drugs and alcohol | | |
| <p>Issue 2: Lack of awareness, education on enforcement of regulations</p> | | |
| <p>Strategy 1: Design and implement proper action plan for public awareness and education</p> | KWCC, PS, DS, CCD, UDA | High priority |
| <p>Management Actions</p> <ul style="list-style-type: none"> • Carry out a needs assessment and formulate an action program for educating target groups • Produce printed materials for information dissemination on guidelines, rules and regulations that should be followed on development activities within the SAMP area | | |

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| Strategy 2: Carry out effective enforcement and monitoring procedures for regulating development activities | CCD, PS, UDA, DS, KWCC | High priority |
| Management Actions <ul style="list-style-type: none"> • Regulate development activities which altering the scenic quality of the blowhole within the 200m periphery under the provisions of the CC Act • Implement prompt legal action against violations and unauthorized construction within the coastal zone • Vest ownership of the land on which blowhole is located as well as the adjacent land (at least 200 meter peripheral area) with the DS of Tangalle • Remove structures located within the 200 m periphery by acquiring land after negotiating with the landowners | | |
| Issue 3: Degradation of environmental and scenic quality of the blowhole and the environs | | |
| Strategy 1: Improve environmental and scenic quality of blowhole, the peripheral area and the entrance point at Kudawella junction | KWCC, GTZ, MWCC, DS, PS, FD, CTB, | High priority |
| Management Actions: <ul style="list-style-type: none"> • Develop an action plan on the wetland area located at the entrance point near Kudawella junction to maintain the scenic and environmental quality • Replant mangrove vegetation and suitable plants to enhance the scenic quality • Resolve the ownership problem with the assistance of the DS Tangalle • Design and implement landscaping plan consistent with the natural setting and supplemented with vegetation cover by the sides of the access roads and around the blowhole | | |
| Strategy 2: Introduce and implement design guidelines for development in the vicinity of blowhole | CCD, UDA, KWCC | Low priority |

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| <p>Management Actions</p> <ul style="list-style-type: none"> • Develop design guidelines for new construction to be located outside the 200 m periphery of the blowhole • Laying down requirement that design guidelines be applied to ensure that development is integrated into the natural environment • Minimize/prohibit use of plastic/polythene and other non biodegradable material • Establish and maintain proper waste collection system with the assistance of PS | | |
| <p>Strategy 3: Launch an environmental and education programme to maintain the scenic quality of the blowhole and its immediate environment</p> | KWCC, PS, CTB, Pol | Low priority |
| <p>Management Actions</p> <ul style="list-style-type: none"> • Design and implement a public awareness and education campaign for both Mawella and Kudawella only after carrying out a proper needs assessment • Educate visitors and villagers on the importance of maintaining environmental and scenic quality of the blowhole • Establish an information center adjacent to blowhole under the proposed blowhole development plan | | |
| <p>Issue 4: Coastal Pollution</p> | | |
| <p>Strategy 1: Establish proper collection system for solid waste and waste oil management</p> | PS, KCC, DS, UDA, DFEO, CFHC, MPPA | High priority |
| <p>Management Actions</p> <ul style="list-style-type: none"> • Set-up regular waste collection system with the assistance of PS and KCC as part of the Blowhole development plan • Provide appropriate equipment to collect solid waste from dwellings/commercial establishment and the surroundings of the blowhole • Establish proper waste oil reception facilities at Kudawella New Fisheries Harbour premises as well as existing anchorage | | |
| <p>Strategy 2: Ensure continuous financial provisions for sustainable waste management system</p> | KWCC, PS, DS, SDA | Medium priority |
| <p>Management Actions</p> <ul style="list-style-type: none"> • Encourage and assist communities to produce compost fertilizer from domestic solid waste • Provide necessary assistance to convert waste oil into more commercially valuable product • Provide necessary technical assistance and training on the above aspects • Allocate part of the revenue that will be collected by way of blowhole entrance fee for waste management | | |
| <p>Strategy 3: Curtail use of non-biodegradable materials especially plastic and polythene in the vicinity of the blowhole</p> | KWCC, MWCC, PS, UDA, DFEO | High priority |

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| <p>Management Actions:</p> <ul style="list-style-type: none"> • Prohibit use of polythene/plastics in the vicinity of blowhole on trial basis • Display sign boards indicating prohibition of polythene • Encourage use biodegradable materials for wrapping and other commercial or recreational purposes • Educate fisherfolk on the importance of avoiding plastics/polythene and discharge of waste oil to in order to maintain environmental quality of the area | | |
| <p>Issue: Inadequate infrastructure facilities at Mawella and Kudawella</p> | | |
| <p>Strategy 1: Establish and encourage introduction of new water supply scheme with construction of a storage tank.</p> | <p>KWCC, SPC, MWCC, PS, WSDB, DS</p> | <p>High priority</p> |
| <p>Management Actions:</p> <ul style="list-style-type: none"> • Prepare estimates on demand for water in considering present and future demand based on current and anticipated development within the SAM area • Determine the cost and benefits of expansion of portable water supply scheme within the SAM area, • Phase out demand according to priority needs and obtain political support/ acceptance for planning and implementation of a new project | | |
| <p>Strategy 2: Minimize wastage and uneconomical uses of current drinking water sources by adopting conservation measures</p> | <p>KWCC, MWCC, WSDB, SPC, PS, DS</p> | <p>High priority</p> |
| <p>Management Actions</p> <ul style="list-style-type: none"> • Encourage and educate people on water conservation measures • Use pipe-borne water only for uses such as cooking and drinking and encourage the use of other sources such as well water for other uses | | |